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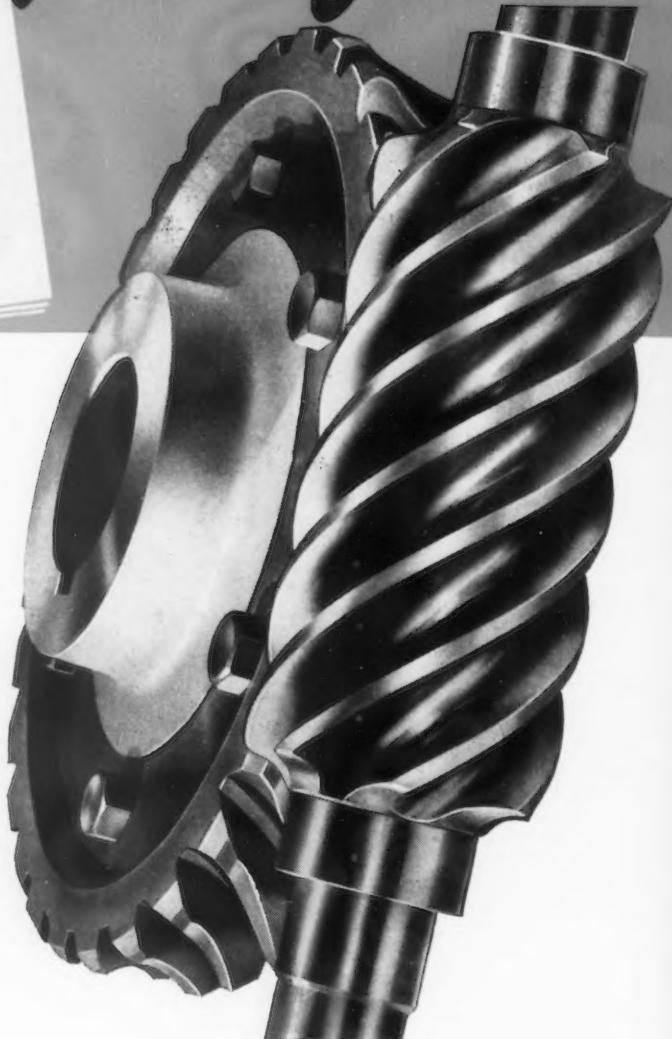
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JANUARY 14, 1943

VOL. 151, NO. 2



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## This Week in...

# THE IRON AGE

### Editorial

Wars Are Won on the Battlefield ..... 21

o o o

### Technical Articles

Welding Armor Plate .....	23
Proper Grinding and Inspection of Steel .....	28
Sesci Steel for Castings .....	32
Steel Clad with Gilding Metal .....	33
Gun Welding With 150-Ft. Leads .....	34
Cast Armor Foundry .....	35
Segregated Production Scrap Cuts Alloy Demand .....	36
Thermal Shock Detects Flaws in A.P. Shot .....	38
Bonderized and Lacquered Steel Sheet .....	39
New Equipment: Plant Service Apparatus .....	40

o o o

### Features

Assembly Line .....	44
Washington .....	48
West Coast .....	52
Fatigue Cracks .....	56
Dear Editor .....	58

o o o

### News and Markets

This Industrial Week .....	60
News of Industry .....	63
Personals and Obituaries .....	98
Machine Tool Activity .....	99
Non-Ferrous Metals .....	100
Scrap Markets .....	102
Iron and Steel Scrap Prices .....	104
Comparison of Prices .....	106
Finished Steel Prices .....	108

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Index to Advertisers ..... 145

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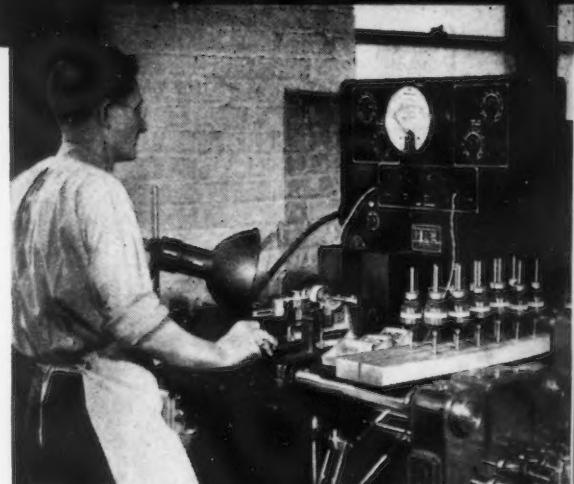
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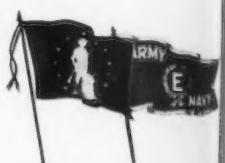
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# THE IRON AGE

JANUARY 14, 1943

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NAVY

## Wars Are Won on the Battlefield

**S**TANGE, isn't it, how some people take issue with axioms? And this in spite of the universal experience that it is fatal to fly in the face of one.

If there ever was a sound and substantial axiom it is that wars are won or lost, in the long run, on the battlefield. Regardless of the truth of the saying about the importance of the men behind the men behind the guns, no amount of production ever won a war until it was put to use by the fighting men at the front. They are responsible for the final decision.

Some of us are now overlooking that fact. Some of us seem to think that this war will be won in the White House, or by the Lend-Lease Administration, or by industry or by American labor.

All of them, as well as all of our civilians can help to win this war. But none of them nor all of them can win it. The winning will be done by our soldiers and sailors. After the rest of us have given them what it takes.

Our men on the fighting fronts and on the embattled oceans know what it takes. They know what they need better than we do. They know where bombers and fighting planes are needed and what kind and how many. They know the kind of tanks and tank destroyers that will do the trick in a given location against a given enemy and what sort of guns they should have to do it. They know from bitter experience whenever it is necessary to make a change in design of an implement of war in order to meet and overcome a superior weapon initiated by the enemy.

These men at the front transmit their knowledge of their needs; and it is a constantly changing knowledge, through the most direct channels of communication possible. They do not write the President about it, nor petition Harry Hopkins and his charming young bride to help them or ask Congress to give them what they need. They go to their superiors in the Army and Navy general staffs, who decide what, how much and when. And these gentlemen, in turn, go to the WPB and Mr. Nelson then puts the finger on the plants to make it.

I think that you will agree that this is a sensible procedure and that it would be hard to better it.

The only trouble with it is that it is non-political and does not provide opportunity for politicians to run the war abroad and at home. And some of them want to do just that. They want to take these things out of the hands of the Army and Navy and the WPB and fight this war in the Senate and the House. Representative Tolan, in fact has introduced a bill (H.R. 7742) to do just that.

American industry would not be in favor of that nor do I think the rest of our people would. They want to see men kept in charge of things who have a record of winning battles, not merely debates or re-elections.

*J.W. Vandeventer*

# Inland Reports

## on Its First Year at War

AMERICAN INDUSTRY is all-out for Victory—has performed production feats that would have seemed impossible before Pearl Harbor. But we all know that the *real* accomplishments—ones that make ours worthwhile—are those of our men on the fighting fronts.

It is therefore humbly, and with full realization of this, that we report on what we have done—putting every ounce of skill and energy into backing up the men who fight for us!

**1942 OUTPUT AT 102% OF CAPACITY.** Inland maintained its production of "fighting steel" at about 102% of rated capacity during 1942, despite lack of an adequate supply of suitable scrap and the loss of hundreds of skilled workmen entering the armed services.

**BREAK OVER 50 PRODUCTION RECORDS.** More than 50 Inland production records have fallen since Pearl Harbor!

\* Open Hearth steelmakers in March had their best month in history.

\* The Blast Furnace Department hit its all-time production peak in the month of December.

\* Near the end of July the 76-in. mill finished enough ship plate in one 24-hour period for the hulls of two Liberty ships. All our mills rolling ship plate turned out enough in July for 34 Liberty ships—nearly half the number sent down the ways that month.

\* —And so on in other departments throughout the mills. Inland steelmakers are determined that our fighting men will not suffer for lack of steel they can supply.

\* Inland mines and quarries produced far more iron ore, coal and limestone than ever before.

\* Lake freighters in the Inland fleet broke their own cargo records, not once but several times in 1942.

**EXPAND AND MODERNIZE FACILITIES.** Not only has top production of steel with installed facilities been maintained, but we completed 27 major expansion and modernization projects to get even greater tonnage.

\* Inland's new No. 6 blast furnace, first one built in the Chicago area since Pearl Harbor, was blown in Nov. 16 and now is pouring out 1200 tons of pig iron a day.

\* We soon will complete construction of and begin operating two more blast furnaces for the Defense Plant Corp.

\* A new electrolytic tin plate plant will soon be in operation to conserve our precious stock of tin.

\* New ore mining expansion assures a larger supply of iron ore.

**HELP TRANSPORTATION OF WAR GOODS.** Reduced customer unloading costs 75%—improved packaging saved 40% of space—increased weights of carloading 36%—lowered car detention time 20%.

**GETS IN THE SCRAP.** Inland contributed heavily to the American Industries scrap campaign, conducted its own extensive scrap advertising campaign, and Inland salesmen are participating actively in the steel companies' industrial scrap drive.

**EMPLOYEES ALL-OUT FOR VICTORY.** More than 2,500 Inland workers have entered the armed services.

\* If medals were awarded to workers in war industries for effort "above and beyond duty," many men at Inland would qualify to receive them.

\* Women are helping carry on at the plant, too—doing a variety of jobs in the mills to help relieve the manpower shortage and maintain capacity output of steel.

\* The entire Chicago Heights plant and many departments at Indiana Harbor already are over the top in the current drive to put 10% of total pay into war bonds.

\* Inland girls have their own Red Cross group—making thousands of bandages. Nutrition groups are endeavoring to improve the general health of workers and fit them to contribute more to the war effort.

\* Many Inland employees are in the plants' own well-trained Catastrophe Organization, ready to meet any wartime emergency. Others are busy in civilian defense work, war group benefits, etc., and are sharing their cars, donating their blood and tightening their belts to do whatever else is necessary to win this war.

**LOOKING AHEAD.** As to the coming year, Inland and its men will continue to push the production of "fighting steel" at top speed. Rather than make predictions, we prefer to let production records speak for themselves. We know that we can pledge the whole-hearted support of every worker to all-out effort until Victory is won!

**INLAND STEEL COMPANY**

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# Welding Armor Plate For Combat Tanks

By EDGAR BROOKER

and

LOREN L. ELLIOT

Ordnance Engineers, Tank and Combat Vehicle Department, Ordnance Department, U. S. Army

THE success of an armored automotive combat vehicle depends on the optimum combination of armor, armament and mobility. The object of this study is to describe the relative merits of welding as compared to riveting of homogeneous rolled armor for the hull of an armored tank. The welded hull shown in outline in Fig. 1 is designed to light tank proportions but is not based on any hull now being made for the U. S. Army nor as far as is known is not coincident with that of any foreign army. It is estimated to weigh not more than 15,000 lb., which is lighter than some production designs of the same relative cubical content, and hence meets the test of mobility. The question of armament is outside the scope of this paper.

The probability of enemy fire against an armored hull is greatest against the front, hence the armor of this hull is sloped upward above the front main drive housing. The rear of this hull also has a high probability of hits, hence a sloping plate is shown here also. Because of the vulnerability of side doors, this hull does not contain them, but is entered from the top of the turret (casting not illustrated) or from an escape door in the bottom.

## Ballistic Requirements

Riveted joints for armored structures are not quite as bad as the newspapers have indicated, because riveted tanks have given a very

... Proving ground ballistic tests have verified the superiority of welded over riveted construction. The saving of welding compared to riveting is an estimated \$291 per light tank hull of theoretical design. The authors received a \$250 award for this paper in the recent \$200,000 Industrial award program of the James F. Lincoln Arc Welding Foundation.

good account of themselves. The efficiency of the riveted joints used in fighting tanks is approximately 5 per cent as calculated for static tests, but working stresses in an armored hull are of no consequence, since sections are very heavy for the operating stresses imposed. Instead, the integrity of a protective hull lies in resistance to ballistic penetration of armor piercing projectiles and resistance to shock from overmatching projectiles that do not necessarily penetrate because of high obliquity impacts. A 75-mm. shot striking at 45 deg. can deliver a shock of 188 ft.-tons at fighting range.

A joint in armor can only be expected to possess no greater penetration resistance to armor piercing projectiles than the armor plate itself. Riveted joints are made with the armor plates tightly butt-jointing together. Hence, except for the cracks, all anti-tank projectiles impacting on the joints are opposed by armor. If rivets do not shear, the penetration resistance of the joint is practically as good as the

virgin plate. Butt straps provide extra thickness against penetration. Ball ammunition impacting against a tight crevice between armor plates becomes liquid and will splash several inches before being stopped unless a lead trap is installed. The lining of riveted tanks takes care of this hazard, so lead splash is of no concern except around openings in the hull where lead traps are installed.

## Shock Resistance Compared

Low shock resistance is the chief weakness of riveted joints. This is measured by the use of soft deforming projectiles which have inferior penetrating power. Though such projectiles are not used in combat, they serve a useful purpose in gauging the shock resistance of joints in armor. The method consists of determining the critical destructive velocity of virgin plate, following which lower velocities are selected for shocking jointed plates.

Fig. 2 shows a hot riveted H plate test assembly made with  $\frac{3}{4}$  in. high

tensile steel rivets on a  $3\frac{1}{2}$  in. pitch and a  $\frac{5}{8} \times 5$  in. butt strap. This plate was struck with one 75-mm. slug at a striking velocity of 906 ft. per sec. In addition to the damage in this photograph, a total of five rivet heads were thrown from the back side. Fig. 3 shows a *cold riveted* assembly identical with that in Fig. 2. The striking velocity for the one slug was 1246 ft. per sec., which resulted in complete separation of one-half of the

plate. For comparison Fig. 4 shows a similar plate welded with the Lincoln Electric Co.'s Armorweld electrode. The cross bar of the H was welded last so as to produce a locked-up stress condition. These slugs were fired at this plate with striking velocities of 1115, 1112, and 1216 ft. per sec. in order of firing. Round No. 1 struck at 1115 ft. per sec. and 3 in. center distance from the vertical leg weld, hence did not stress the weld sufficiently

to prove anything. This one impact against a riveted plate would have broken it in at least two parts. Rounds 2 and 3 struck in a highly stressed area and no cracking occurred on the front or back sides of the joints. Such shocks will frequently break an unwelded plate.

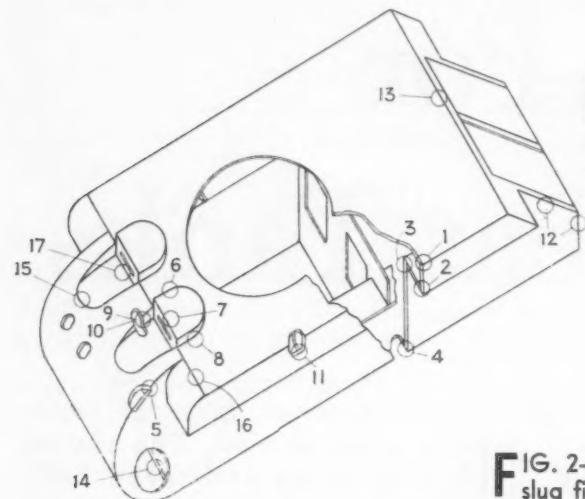
It is interesting to note the results of shooting a second welded plate of the same armor and welded under the same conditions except that Lincoln Stainweld electrode was used. Two slugs at 957 and 970 ft. per sec. caused 38 in. of cracking in the welds of this plate. This is not an exact comparison of the low and the high alloy weld metal but, as shown by numerous test data, the Armorweld electrode has given superior results to those obtained with the better established Stainweld type.

The data above are summarized in Table I wherein ballistic impacts are given in terms of kinetic energy of impact, and damage is given by length of joint broken.

#### Resistance of Welded Joints to A.P. Shot

Welds in armor should possess resistance to projectile penetration equal to that of the plate, but stainless steel weld metal is lower in penetration resistance than armor plate. This deficiency does not exist in welded joints when butt straps are used or when weld reinforcements are not removed. The arrangement of welded joints in the hull of Fig. 1 is such that rare or lucky hits only would hit them. The armor and welds of this vehicle are sufficiently thick that any projectile smaller than the 37 mm. size cannot penetrate at battle range. Furthermore, 37 mm. or heavier anti-tank projectiles are larger in diameter than the width and root gap of any of the welds used; hence if such impacts should occur on these joints, the projectile would be opposed by plate as well as by weld metal. Penetration test data frequently show that the penetration limits of the welded joints with normal reinforcements are 100 per cent of that specified for the plate. The low penetration resistance of stainless weld metal does not cause points of weakness in a hull.

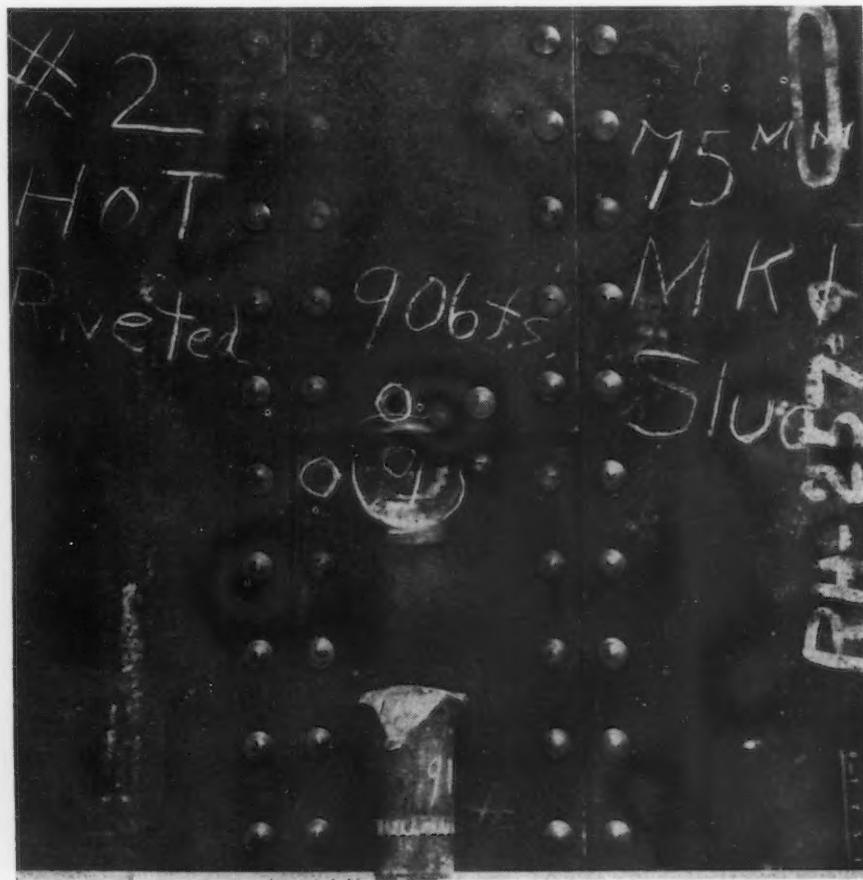
The use of 3-ft. square welded ballistic test plates as in Fig. 4 have not been considered representative of stress conditions in welded armored hulls by those who appreciate the internal contractual and tensile stresses that occur at welded joints.



**FIG. 1—Hull for a light tank of theoretical design in which riveted construction is compared with arc welding.**

BELOW

**FIG. 2—Effect of a 75-mm. steel slug fired at 906 ft. per sec. at a hot riveted H test plate. Rivets are  $\frac{3}{4}$  in. high tensile steel at  $3\frac{1}{2}$  in. pitch, with  $\frac{5}{8} \times 5$  in. butt straps.**



Before any ballistic shock or penetration tests were performed on a welded hull, it was prophesied that extensive failure could be expected at points widely separated from projectile impacts. It was assumed that great internal stresses would exist and that a severe shock on one side of the structure would cause wholesale failure. The qualification of welding procedure with H test plates as shown in Fig. 4 was also criticized because when tested in this manner the weld metal was thrown in compression on the face side and put in tension on the back side as occurs in the bending of a simple beam. With a few exceptions the welded joints in a tank hull are so located that projectile impacts primarily place the weld metal in compression.

When it became possible to conduct ballistic shock and penetration tests of a welded hull, the use of H plates for testing and developing weld quality was justified. Fifteen 75 mm. slugs impacted against one side of a welded hull caused only local failures adjacent to the points of impact. No cracks occurred elsewhere that could be explained by shock wave propagation or by excessive internal stresses. Just as shock impacts located more than 2 in. center to center distance from the welds in H plates caused no damage, so in the welded structure, ballistic damage occurred only within a small area surrounding the depression caused by the projectile. The hazards of internal stresses were not evident. In order to judge the ballistic shock resistance of riveted joints for comparison with the welded joints, the riveted and welded H plates shown in Figs. 2, 3 and 4 were made. However, in the construction of riveted tank hulls the most common joints are angle butts in which the plate edges are placed in close contact. The arrangement of plates is such that hits from the side, front and rear do not fall on unsupported plates or with few exceptions on plates supported only by a butt strap inside. The H plate, therefore, represents an abnormal test for riveted joints.

#### Design of Welded Joints

Fig. 5 illustrates the welded joints in the homogeneous armor of the hull shown in Fig. 1. It will be noted that simple fillet welds are avoided for joining of outside plates except those on the bottom. Fillet welds at the inside transverse, front stiffener joining the curved plate to



**FIG. 3**—Same test plate as shown in Fig. 2 but struck with a 75-mm. slug at 1246 ft. per sec. impact velocity.

• • •

**FIG. 4**—A welded H test plate that was struck with three 75-mm. slugs at 1115, 1112 and 1216 ft. per sec. impact. None of the welds cracked.



**TABLE I**  
**Summary of Ballistic Tests on Riveted and Welded Armor Plate**

Fig. No.	Construction of Test H Plate	Impact Kinetic Energy, Ft.-Tons	Damage
2	Hot riveted, $\frac{3}{4}$ in., rivets, $\frac{5}{8} \times 5$ in. butt strap	96	Sheared 5 rivets on 12 in. cross bar of H
3	As above but cold riveted	181	54 in. of joint broken, 19 rivets sheared
4	Manually arc welded with Lincoln Armor weld, 25 deg. incl. angle, double bevel, with root spacer bar	463	No cracking of welds

the floor plate are far enough aft so that ballistic impact is of no concern.

Root gap openings shown in the details of Fig. 5 have been found by experience to permit complete penetration of root passes. The most difficult part of making a sound weld with stainless steel electrodes in armor is the deposition of sound root passes with complete penetration. The plate edge preparation for this vehicle requires 45 deg. bevels and these bevels are made in such a way that the flame cutting machine will not have to ride or be guided upon the cross-section of any plate. For example, detail 4, Fig. 5, could be made with a flame cut bevel in the thicker plate at an angle of 30 deg. from the cross-sectional plane. The amount of flame cutting is de-

creased by requiring all preparation on the thinner mating plate.

Welds in self-hardening steels such as armor result in a hard heat affected zone. The Knoop hardness shows the maximum hardness to be approximately 450 in the plate immediately adjacent to the weld metal. Thus it is reasoned that a layer of low ductility adjoins the stainless steel weld in armor unless post heating is used. This operation is not necessary or practicable for rapid production. The 45 deg. bevels of details 9 and 10, for example, are therefore justified because this brittle zone is increased in surface area over that which would result if a smaller included angle were used. Simple butt welded joints with no beveling have been made and have given fair results in ballistic shock. Such joints use a mini-

mum amount of weld metal which is an advantage for reducing the consumption of critical alloys and minimizing welding hours, but are not favored for high shock strength. H plates have been made with included angles at the welds of 30 deg., 60 and 90 deg. with a view to demonstrating relative ballistic shock strength, but the ballistic test is not quantitative enough to make such distinctions. It is interesting to note that the most successful tank welding contractors today are using 45 and 60 deg. beveling. Outstanding welded H plates have been made with a "broken backed" edge preparation as shown in Fig. 6.

Table II illustrates the great saving in weight which results from the use of welding in armored structures. These data were obtained by detailing riveted joints to take the place of each of the welded details shown in Fig. 5. As indicated previously the static joint efficiency of these riveted joints is approximately 5 per cent. If they were made with sufficient rivets and butt straps or angles to provide the customary 75 per cent efficiency of structural riveted joints, the resulting weights would be excessive and the comparisons would be still more in favor of welding. The efficiencies of the angle butt welded joints have not been calculated or estimated because the stresses of ballistic impact are unknown. However, ballistic tests of H plates frequently illustrate plate failure equal to failure in weld metal or fusion zone, hence the ballistic efficiency of welded joints must be almost 100 per cent.

#### Production Advantages of Welding

Other than the ballistic performance illustrated by Figs. 2, 3 and 4, welded construction offers numerous advantages from a production standpoint. Plate preparation for riveting requires almost perfectly flat plates to give good fits against butt straps and faying angles or plates. Flattening of armor cannot be performed by stretcher leveling entirely, and hence brake presses and considerable manual labor are necessary for flattening plates that are to be riveted. Armor to be welded is flattened to a satisfactory degree by stretcher leveling. A flatness tolerance of  $\frac{1}{8}$  in. in 3 ft. is acceptable for manually welded construction. A root gap variation of  $1/16$  in. is taken care of by depositing more or less weld metal.

Plate edges for welded construc-

**TABLE II**  
**Comparative Weights of Single Riveted and Arc Welded Joints Per Linear Foot**

Joint Detail Fig. 5	Corres. Riveted Constr.			Weight of Rivet Heads and Butt Straps Lb.	Weight of Reinforcements and Fillets Lb.	Type of Joint
	Rivet Diam. In.	Pitch In.	Butt Strap or Angle In.			
1, 2, 3	$\frac{5}{8}$	$3\frac{5}{8}$	$\frac{1}{2} \times 2\frac{1}{2} \times 3$ angle	10.5	0.33	90 deg. butt
6, 8	$\frac{3}{4}$					
4	$\frac{1}{2}$	$3\frac{1}{2}$	$\frac{3}{8} \times 2\frac{1}{2} \times 3$ angle	8.2	0.15	90 deg. butt
5, 9, 17	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{2} \times 3 \times 3$ angle	12.1	1.71	90 deg. butt
7	$\frac{5}{8}$	$3\frac{5}{8}$	$\frac{1}{2} \times 2\frac{1}{2} \times 3$	10.7	0.32	90 deg. butt
10	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{2} \times 3 \times 3$	12.1	0.98	90 deg. butt
11	$\frac{3}{8}$	3	$\frac{1}{4} \times 2 \times 2$	4.1	0.21	90 deg. butt
12	$\frac{3}{4}$	$3\frac{5}{8}$	$\frac{1}{2} \times 3 \times 3$	9.7	0.20	90 deg. butt
13	$\frac{5}{8}$	3	$\frac{3}{8} \times 6$ strap	9.6	0.18	135 deg. butt
14-15	$\frac{3}{4}$	3	$\frac{1}{2} \times 6$ strap	10.5	1.51	butt

tion can be flame cut everywhere except at bolted joints which hold machined parts as components of the hull. Main drive housings are bolted to form the front of some tank hulls. The hull shown in Fig. 1 has no such joints, the bow being completely welded, and the main drive is intended to be inserted through the turret opening. This opening need not be finished after flame cutting because the turret is supported and guided on a machined lower base ring. Flame cutting of armor need not be followed by flame softening but welds can be made directly to the flame cut surface provided all heavy scale is removed by touch-up grinding. The hardness of the weld heat affected zone in armor is not decreased by previous flame softening.

Riveting would require drilling approximately 1000 holes in the hull illustrated in Fig. 1. These holes must be reamed before driving the rivets. The following tabulation illustrates the man-hours required for these operations.

Welded construction requires drilling only those holes by which removable parts of the hull are fastened by bolts. The operations of planing plate edges and drilling rivet holes takes up valuable machine tools which are needed badly in this emergency for the manufacture of other war materiel. Flame cutting equipment is less critical in supply than planers, shapers or drills.

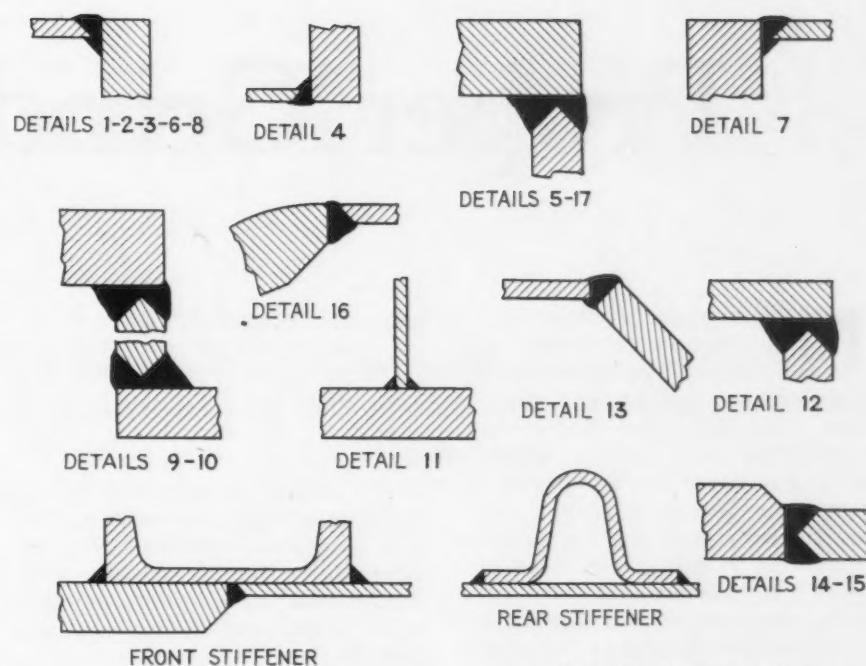
#### Field Repair

Tanks in battle will inevitably become penetrated or will come back to field shops with bent plates. If the joints are made by riveting, it will be difficult to repair them, and at best the repair will be heavy for the protection it provides. Holes in armor made by penetrating projectiles can be filled by welding or by inserting repair plugs without an increase in weight. Bent plates in a welded hull will be of no concern unless cracks occur, and these can be easily filled by welding, while in riveted construction, cover plates would have to be riveted over the openings to prevent the entrance of small arms projectiles or lead splash.

#### Conclusions

Welded construction for an armored tank hull offers the following advantages over riveting:

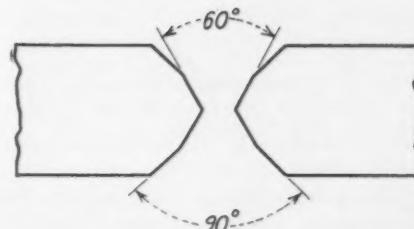
- Welded joints provide ballistic shock and penetration resistance



Note: Bevels flame cut at 45° to featheredge

**FIG. 5—Details of the various welds on the light tank hull outlined in Fig. 1. The detail numbers correspond to the locations numbered in Fig. 1.**

**FIG. 6—On the welded H plate impact tests, double angle "broken back" edge preparation showed up well. The heat affected zone is less critical from the point of view of ballistic shock.**



against enemy fire equal to that afforded by armor plate, but riveted joints are very much weaker than welded joints and weaker than unwelded plate. Unless the rivets in riveted hulls are seal welded, riveted joints offer an added hazard of flying rivets.

b. Welded joints in this armored hull effect a 9-10 per cent or 1533 lb. saving in weight represented by the rivet heads and butt straps in a riveted hull.

c. Manually arc welded fabrication of the armor plate in a hull requires only 40 per cent of the man-hours needed for riveted fabrication. If one man-hour is worth \$1, this amounts to \$291 per hull. Manual welding provides a 77 per cent increase in rate of production.

d. Machine tools needed badly for other war materials are released by the use of welding as compared to riveting.

#### Comparison of Man-Hours Required to Fabricate a Riveted Hull As Compared to a Manually Arc Welded Hull

Operation	Man-Hr. Riveted Hull	Operation	Man-Hr. Arc Welded Hull
Drilling butt straps.....	104	Flame cutting plates and edges.....	9
Drilling armor plate.....	184	Assembly and fit up.....	40
Reaming holes, fit up and assembly.....	104	Manual arc welding.....	150
Riveting.....	96	Total.....	199
Total.....	490	Saving in man-hours effected by welding.....	291

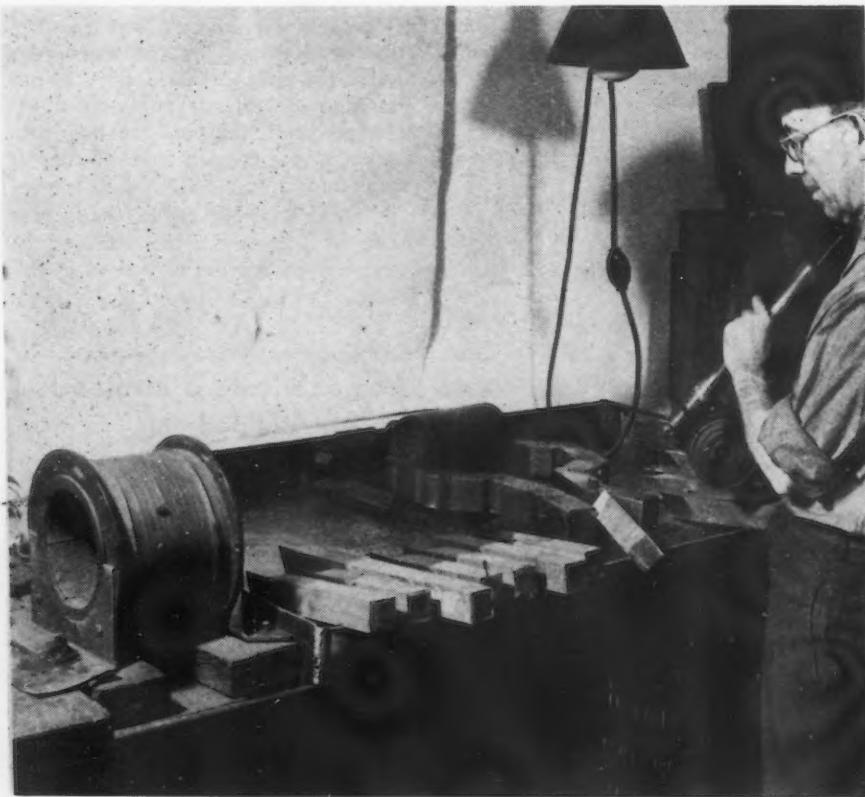
# Proper Grinding and

THAT improper grinding and faulty inspection should involve such an essential material as tool steel is difficult to understand, especially since this metal is becoming increasingly scarce. Yet both practices are by no means uncommon. Too, it is equally difficult to understand why the simple precautions necessary for the safe handling to tools made of this steel are so often neglected. Merely a fundamental knowledge of the properties and limitations of tool steel would prevent much suffering and save many lost man-hours annually.

Consequently, it is felt that the following, which like in the case of a previous article on tool steel

\* "Practical Suggestions Concerning the Heat Treatment of Tool Steels," THE IRON AGE, Oct. 8, 1942, page 47.

**FIG. 1—Equipment used by the General Electric Works Laboratory for magnetic crack detection. From left to right are seen the demagnetizing coil used upon completion of the examination; some tools to be tested; the link-type electromagnet in use; and, in the hands of the man, the spraying equipment for applying the iron oxide powder suspended in kerosene.**



By J. E. ERB  
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• • •

by the writer\* is presented not as newly discovered information, but as a review of familiar but often disregarded facts, should prove helpful alike in conserving this valuable metal and preventing unnecessary accidents.

Improper grinding is the primary cause of cracks, both visible and invisible, in tool steel. When visible, these cracks are easily recognizable. That is, the direction of the principal cracks is always perpendicular to the direction of the grinding. Also, they are generally connected by smaller secondary cracks. This

produces a kind of "mosaic" appearance on the steel.

## Magnetic Test Method

Suspected but invisible cracks produced by improper grinding should be sought for by the magnetic test method. By this method, the tool steel to be inspected is placed on a link magnet with the flux longitudinal (Fig. 1), so that it will intercept any possible cracks at right angles. While thus magnetized, the steel is sprayed with kerosene which has in suspension finely divided particles of magnetic iron oxide.

Cracks in the metal set up magnetic poles, which in turn attract and hold the iron-oxide particles, thereby outlining a crack invisible to the naked eye, Fig. 2.

## Hardening or Quenching Cracks

Hardening or quenching cracks, Fig. 3, are distinguished from grinding cracks in that they are usually larger and fewer in number. Also, in the main they are symmetrically disposed, following holes, corners, changes of section, or weaker portions of the tool.

The cause of the cracks in this die, which incidently is an example of poor design, was as follows: The upper, lighter portion cooled faster and reached the temperature of the quenching oil first, remaining constant as to volume. The central and lower portions, cooling more slowly, continued to contract, thus putting a tension on the weaker section between the rectangular holes and the upper edge. Consequently, the die cracked.

The remedy is obvious. These rectangular holes should have been placed so as to permit more metal between their upper corners and the top edge of the die. Also, there should have been more metal between the lower corner and the larger impression. In addition, the cooling could have been more nearly equalized by drilling dummy holes in the middle and lower sections of the die.

Tool steel, it must be remem-

# Inspection of Tool Steels

bered, will tolerate all kinds of compression, but it is weak in tension, particularly if the tensile stresses are localized by some edge, nick, corner, or tool mark. The hardening cracks on high speed cutting tools are due partly to improper quenching, and to surface imperfections not removed prior to hardening.

## Softening

Together with causing cracks, improper grinding may also damage tools in other ways, such as by softening. Shown in Fig. 4 is a cross-section of a set of carbon tool steel test pieces which were softened, but not cracked, by improper grinding.

To facilitate the test, these  $\frac{5}{8}$ -in. square pieces of carbon tool steel were first hardened, then broken across the middle. Next, the fractured surface was ground, then etched in acid. The dark shaded outer portion represents the hard "case" or shell (Rockwell C67), the light circular areas at the center represent the unhardened case (Rockwell C45), while the light streaks or bands show the areas softened by improper grinding

**... To aid in the conservation of critical materials, this article reviews briefly the familiar but often disregarded precautions to be taken in the safe and proper handling of tool steel.**

• • •

(Rockwell C55). In contrast, Fig. 5 shows the same specimens properly ground. Hardening is uniform and there is absence of bands.

## Hardening

It is also possible to grind annealed high-carbon steels so drastically that they harden. That is, the surface of the metal is raised momentarily to a red-heat and then instantly chilled, after the grinding wheel passes, by the mass of cold metal beneath, or by the flushing of the grinding coolant, Fig. 6. The resulting hard spots frequently cause trouble in machining. Cracks are almost invariably associated with this kind of grinding.

Since tool steels can create hazards according to their composition and according to the methods of

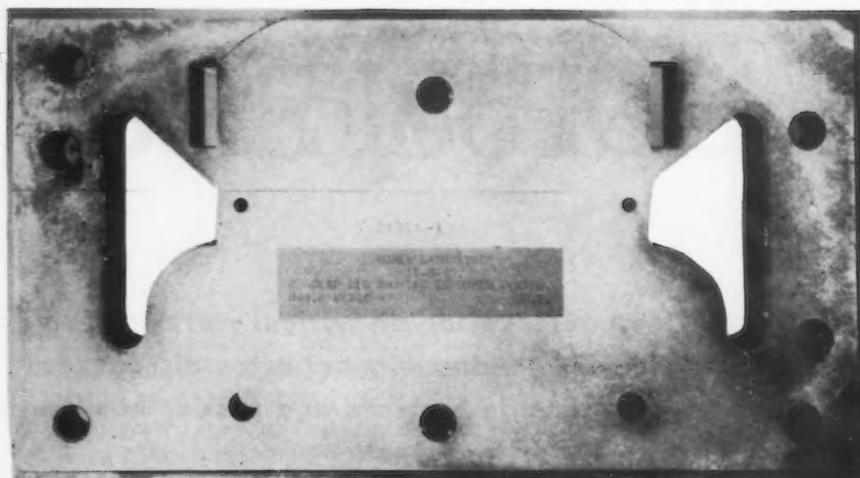
loading applied, failure to recognize their especial properties and limitations when handling them can result in certain dangers. For instance, it is highly dangerous to strike a piece of hard tool steel with a steel hammer. Many persons have lost their sight in this manner.

As a guide, tool steels may be divided into "hard" and "tough" steels as follows:

1. Hard steels: All steels containing over 0.55 per cent carbon, or which are capable of being hardened to over 61 Rockwell C. Higher carbon steels, even when their hardness is reduced to less than 61 Rockwell C, are still held to be in the hard steel class.
2. Tough steels: Those containing less than 0.55 per cent car-

**F**IG. 2—Cracks in turning tools located by iron-powder test.





**F**IG. 3—Quenching cracks in a die. The poor design of the die resulted in uneven cooling.

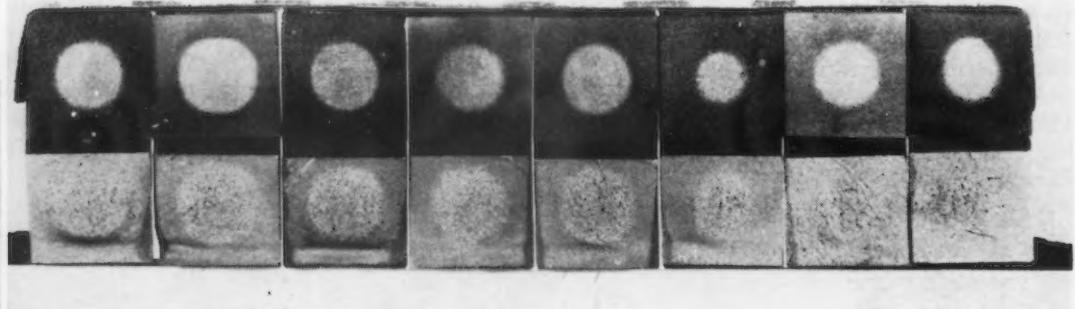


**F**IG. 4—Cross-sections of a set of carbon tool steel test pieces which were softened, but not cracked, by improper grinding.

RIGHT

**F**IG. 5—Cross-sections of a set of carbon tool steel test pieces, properly ground.

4A      10      6A      13      11      14      15      7



LEFT

**F**IG. 6—Grinding high-carbon tool steel, using water as grinding coolant to prevent "burning" or cracking.

tion certain fundamental limitations.

For instance, much has been said and printed about fatigue strength, and the effect of notches, sharp corners and stress raisers of various kinds in lowering fatigue strength. If this is true of low and medium carbon steels, obviously it is many times multiplied in the case of tool steel, the very composition of which (high carbon) is a "stress-raiser."

Now it is known that a square piece of hard tool steel has less strength in bending than a round piece, due simply to the stress-raising effect of the corners of the square pieces. In a piece of soft

bon, and tempered so that the hardness does not exceed 61 Rockwell C.

#### Strength and Toughness Test Figures

Too, since potentially all tool steel is weak and brittle, it is advisable not to be misguided by strength and toughness test figures.

These tests generally are made on carefully prepared specimens, of uniform section, so loaded that the stresses are equally distributed. Consequently, high values of strength and toughness when obtained in this manner may be misleading if applied to individual cases without taking into considera-



1                    2                    3                    4                    5                    6

Characteristics	1	2	3	4	5	6
Steel analysis, per cent of carbon	.....	0.65	0.61	0.54	0.89	0.64
Hardness on face of head, Rockwell C	64-65	60-61	66-67	64-66	68-70	55-58
Remarks	Spalled	See Note 1	Spalled	Spalled	Spalled	See Note 2

Note 1. The head was not spalled. The ball was flattened down and split because it was hardened only on one side. The other side was dead soft.

Note 2. Not spalled, but one corner was entirely knocked off as by a heavy, shearing blow. Hardened case was very shallow. If properly hardened, this probably would not have occurred.

Fig. 7—View showing spalled corners of six ball-peen hammer heads.

steel, this effect would hardly be noticed.

Likewise, the surface finish on a bridge member has little effect on the strength, whereas the direction and kind of grinding applied to a delicate cutting edge has much to do with its strength. So, also, have grinding cracks or hardening cracks.

#### Defective Impact Tools

Defective impact tools also are highly dangerous. Shown in Fig. 7 are six defective machinist's ham-

mers collected some time ago by General Electric's tool and gage service department and investigated at their request by the company's Schenectady works laboratory.

During the investigation, the characteristics listed in the table and notes under Fig. 7 were made.

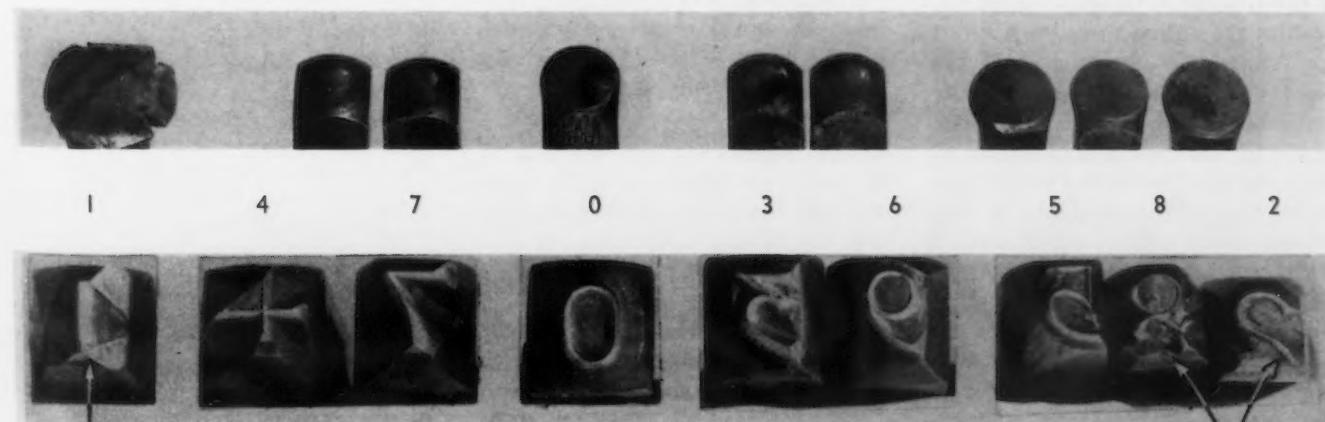
Shown in Fig. 8 is a hazardous condition which may occur when impact tools are too soft. The nine figures are number stamps after a test as a set. In the upper right

hand corner is shown the head of a stamp which has been badly "mushroomed." Obviously, this condition is dangerous, since a piece of the split metal is likely to fly off the next time the tool is struck.

Tools of this type should be ground to bevel the head, as shown by the next two stamps to the right. Better still, they should be returned to the stock room for proper disposition.

Note how the degree of upsetting decreases with the increase of hardness of the head, as shown by the

Fig. 8—Number stamps after a test as a set. All stamps softer in the body than 44 Rockwell C were bent.



following table, reading from left to right in the pictures:

HARDNESS—ROCKWELL C			
Stamp No.	Point	Body	Head
1.....	33	0	25
4.....	62	62	48
7.....	52	44	51
0.....	58	51	30
3.....	62	62	54
6.....	60	60	54
5.....	58	7	20
8.....	49	2	23
2.....	52	8	19

It should also be taken into consideration that stamps in which the body is too soft also create a hazardous condition. All stamps softer in the body than 44 Rockwell C were bent. This may cause the

stamp to fly out of the hands when struck.

#### Tough Tool Steel Under Bending

Tough tool steel when exposed to a steady bending load may be more dangerous than the hard variety. This is because of its natural "springiness" or resilience. For example, in conducting bend strength tests on tool steel, the specimen is set up as a simple beam, supported at both ends and loaded in the middle.

When the specimen breaks, the halves of the tough steel will usually fly with terrific force, while the halves of the harder and more brittle steel are not so likely to fly.

Consequently, because of these and other related experiences, the following general conclusions as to the dangers associated with tool steels have been arrived at:

1. In impact, the hard steels are

especially dangerous. Small particles spalled at the corners and edges are most likely to cause injury.

2. Tough tool steel, on the other hand, is probably the safest material available for use in impact. The danger associated with this steel, however, is its "springiness" or resilience. Although tough tool steel will stand considerable deformation before breaking, enormous elastic forces are built up so that when it does let go, these forces are released and large pieces may fly off with terrific force.

3. Hard steels are classified as those containing over 0.55 per cent carbon, or over 61 Rockwell C hardness.

4. Finally, since scale has been known to cause serious eye injuries, all surfaces subject to impact should be ground to remove scale and projections, and to round off or bevel all corners.

## Sesci Steel for Castings

**A**IMING at the utilization of the maximum amount of its own scrap in its internal metallurgical processes, the London, Midland & Scottish Railway Co. at its locomotive works at Crewe installed in 1932 two five-ton pulverized-coal-fired rotary furnaces, according to F. A. Lemon and Hugh O'Neill in an article for the Iron and Steel Institute, London.

Since it was claimed for this type furnace that the high working temperature available would give very fluid metal, heat from exothermic bath reactions due to the oxidation of pig iron could be dispensed with. Besides the reduced consumption of pig iron, the advantage of the Sesci furnace over the Tropenas converter, which had hitherto been employed for the manufacture of steel castings, lies in the better control of the steel-making process and the avoidance of any metal loss by projection. Adjustment of the pulverized-coal distributor and the positive air blower should produce either oxidizing or reducing flames as required, while temperature and composition control is much more

flexible than in the converter.

It is a disadvantage that owing to the absence of side doors, the Sesci bath can be observed only by stopping the flame and sliding back the exhaust head. Great difficulties were encountered in securing a good life from the refractory linings. With intermittent working, this has been raised from a beginning of 29 heats per lining to an average of 125, with a record value of 226. A daily patching technique which enables the lengthening of refractory lining life has been developed. The most useful lining found is one with adequate refractoriness and low after-expansion, but, above all, a facility for forming a durable ceramic bond with the patch repair.

The furnace charge consists of 99.5 per cent railway and tire scrap with not more than 1.5 per cent pig iron and is introduced into the furnace horizontally from boxes by a standard type of ground charging machine. In some heats, a small amount of anthracite is added with the steel scrap which together with a little pig iron, provides carbon to

induce a boil. After very many early trials, it has been found that to produce a boil and work down the charge is simpler and produces better steel than to attempt a direct fusion process without boiling. Ore additions are seldom required. Additions of limestone are made to the slag after the first carbon sample has been taken.

An analysis of ingot and slag showed the absence of  $\text{FeO}_2$ , which is remarkable in view of the rather low temperature at which this furnace is operated. Carbon content on analysis was 0.17 per cent; silicon, 0.35 per cent; manganese 0.81 per cent, sulphur, 0.048 per cent, and phosphorus, 0.042 per cent. Results of physical tests on forged sample after normalizing were above average.

	Longitudinal	Traverse
Yield point, tons per sq. in....	22.0	20.0
Max. stress, tons per sq. in....	33.2	33.5
Elongation on 2 in., per cent...	33.5	30.0
Reduction of area, per cent.	61.0	46.4
Izod value, ft-lb..	100, 75, 66	30, 35, 42

# Steel Clad

## With Gilding Metal

By T. C. CAMPBELL  
*Pittsburgh Editor, THE IRON AGE*

A PEACETIME steel cladding process developed by the Superior Steel Corp., Pittsburgh, several years ago, has gone to war for the United Nations and is annually saving hundreds of thousands of tons of strategic copper. Originally designed as a method for producing a composite steel with an ordinary carbon core and a stainless steel surface, the process is now being utilized to produce a composite metal, 80 per cent of which is ordinary steel, and the balance or 20 per cent gilding metal (90 per cent copper and 10 per cent zinc).<sup>1</sup>

<sup>1</sup> See THE IRON AGE, July 30, p. 85.

Long before the United States Government adopted the Superior method for producing material utilized in the production of 30 and 50 cal. bullet jackets, Great Britain, Canada, the Soviet Union and China had already been using this composite metal. Recently, however, the small arms division of the Ordnance Department decided upon the Superior process and at present is turning out millions of bullet jackets by the use of this clad metal.

The orders from the United States Government, however, were so exceptionally large that the Superior Steel Corp. alone could not fulfill the total demands. In order to facilitate this particular type of war production and fulfill the needs of the United States, as well as that of the United Nations, the Superior Steel Corp. offered the use of its process without royalties for the duration of the war and during a period of six months thereafter. This contribution to the war effort received the support and commendation of the Ordnance Department and subsequently 18 steel companies were granted permission by Superior to use its process for making gilding metal clad steel

strip for the fabrication of bullet jackets. In addition to agreeing to discontinue the use of this process six months after the termination of the war, these companies have also granted to Superior Steel the right to use any improvements made by them on the Superior process.

The potential uses for the Superior cladding process during

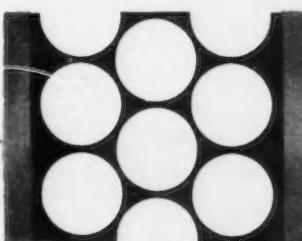
peacetime appear to be sizable, since the composite metal is not limited to steel and gilding metal alone, but can also utilize stainless steel, silver, copper and other metals, depending upon the end use for the strip. It is said that a large new field for special products after the war will undoubtedly open up and the process will be of great value for the manufacture of cook-

**M**EETHOD of cladding steel strip with gilding metal and its conversion into bullet jacket cups. The drawings indicate the proper facings with the steel center. In this particular case the top and bottom facings, shown in black, are referred to as 10 per cent or a total of 20 per cent gilding metal.

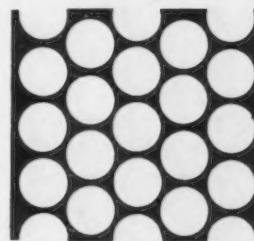
FINISHED COLD ROLLED STRIP—BEFORE SHEARING

ILLUSTRATING TWO METHODS OF SHEARING OFF EDGES OF STRIP

COLD ROLLED AND ANNEALED SHEARED STRIP



.50 Caliber  
Scrap from unheated strip



.30 Caliber  
Scrap from sheared strip

WEBBING SCRAP LEFT AFTER BLANKING AND CUPPING

Various types of cups  
as furnished to the Arsenals

Unfinished bullet jackets—  
ready for filling and finishing

ing utensil material, store front material, radiator material, and numerous other uses. For the time being, however, total output involving the gilding metal process is to be devoted exclusively to direct war requirements.

Many of the 18 steel companies which have been granted permission to use the Superior process are in production and others are expected to produce substantial tonnages at an early date. While only 30 and 50 cal. bullet jackets are being made from this composite metal at the present time, experiments have indicated that larger shell cases can be drawn from this material. Whether or not the use of the cladding process will extend to larger components is as yet undetermined but at least the possibility is there. Such a move would further expand the tremendous saving in copper which at the present time represents one of the tightest raw material problems.

Briefly, the process of making gilding metal clad steel strip con-

sists of starting out with a special section of ordinary carbon steel rolled by several steel companies. The steel section with the gilding metal facing is given special treatment for keeping the metals together. The steel section with its gilding metal facing secured in place is then placed in a furnace for proper heating. After proper heating, the material is broken down by several passes into a hot rolled gilding metal clad steel strip. The latter is then annealed, pickled, cold rolled and sheared.

The gilding metal clad steel strip is then securely packed in coils and shipped to fabricating companies which punch out the disks and make the cups which later are drawn into the finished bullet jackets by various arsenals. In the case of Superior Steel, the cups are returned from the fabricator to their mill where the surfaces are properly cleaned by tumbling and where the cups are properly annealed prior to being shipped to locations where bullet jackets are drawn.

Accompanying photograph shows the gilding metal clad steel strip and its conversion into bullet jacket cups. Practices are being developed to recover<sup>2</sup> the copper and zinc, as well as steel, from the scrap strip resulting from the punching operations.

<sup>2</sup> See THE IRON AGE, Nov. 12, p. 51.

Interesting from the standpoint of Superior Steel is the fact that recently the company had made substantial expansion in its finishing mill processes including the installation of new cold rolling equipment and new heating furnaces. The company was admirably situated to immediately begin the production of the gilding metal clad steel strip since all the facilities which previously had been utilized for non-essential stainless steel production were available. It is also thought that the company has already found other uses for its process besides the making of material for small caliber bullet jackets, but for the time being at least this lies within the realm of censorable material.

## Gun Welding With 150-Ft. Leads

APPLICATION of gun type welders as far as 150 ft. away from the source of power is possible with the new Thomson Power Pack, developed by Thomson-Gibb Electric Welding Co., Lynn, Mass. The scope and efficiency of resistance welding is increased by taking three phase standard voltage a.c. and delivering low voltage d.c. to the welding gun. This arrangement is especially useful for welding guns in multiple. For spot and projection welding, the Thomson Power Pack finds many applications.

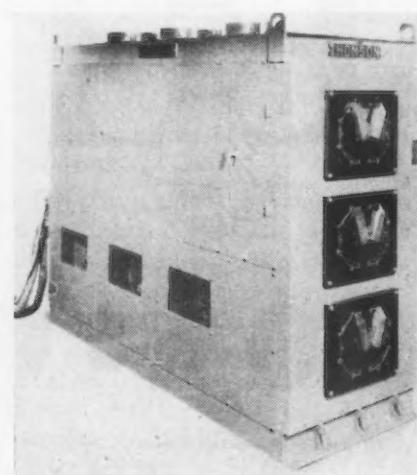
Because the unit furnishes d.c. for the welding, there is no problem of cable reactance and much less power is required to transmit the useful welding current to the point of the weld. The power factor is two to three times better than it would be with single phase a.c. Use of the regular three phase power source permits better balanced loading. Approximately 200 kva. distributed over three phase is equal to 500 kva. on the ordinary single phase a.c. gun welder.

The Power Pack houses a three phase transformer and three phase

copper oxide rectifier with connecting bus bars, air blowers for individual cooling of each unit, ignitron type contactors, timing control and voltage regulators. The pack is capable of furnishing current for welding aluminum up to 0.040 in. thick or for welding stainless steel or mild steel up to 0.064 in. thick.

• • •

THE new Thomson Power Pack. The voltage regulators permit 16 adjustments of output d.c. voltage. Timer is calibrated in cycle steps from 1 to 300 cycles.



A distributor for connecting each of several welding guns individually and successively to the current source may be mounted on the top of the unit. Distributors may be provided with 12 or 24 stations. All guns can receive current within 8 sec. if desired.

The control circuit, operating with a pushbutton switch on each gun, fires the gun when the pushbutton is held down until the distributor station operates to connect the gun to the Power Pack during the weld cycle. Two guns cannot fire at once and any given gun fires only when its individual switch is closed. Multiple guns, however, must be working as a team, for each receives the same current and welding time for any given set-up.

The cables connecting the guns to the Power Pack are flexible and easy to handle. The smaller unit employs cables of 500,000 circular mil cross section; the larger uses 1,000,000 circular mil cables. The guns are usually of the manually operated type with a 300-lb. welding pressure. Light or heavy, air, hydraulic or manual guns may be used.

# Cast Armor Foundry

RIGHT

**S**ETTING a tank turret core in a new cast armor foundry. Large arbors are baked into the core, to which is attached the cross arm visible in the photo. The arm is clamped to the flask. This huge one piece core is baked in a special oven which permits lowering the core directly into the oven from above. This plant is devoted solely to the production of cast armor parts.

• • •

BELOW

**A**MOLDING bay in a cast armor plant, showing open turret molds in the foreground and molds for smaller pieces in the background. In the upper center is a sandslinger used for ramming up large molds.

• • •

BELOW RIGHT

**P**OURING a tank turret mold with a bottom pour ladle. Note the extensive clamping devices.



# Segregated Production

AS the war production program gains momentum alloy steel production scrap from turnings, borings, and also flashings, clippings and crop ends, is becoming a potential source of alloying elements that is of the first magnitude. WPB scrap segregation order, M-24-c, of last June is taking on renewed importance. This ruling will without doubt become more and more helpful as the kinks in the war production program are smoothed out.

Already, at two Bethlehem plants, one-third to two-thirds of all alloying elements used are now being

*Other articles on the reclamation and conservation of metals appeared in THE IRON AGE, Jan. 29, March 26, April 2, April 16, Nov 5, and Nov. 19, 1942.*

provided by the segregation and remelting of alloy scrap. But the cost and expenditure of manpower for segregation is higher in many instances than it should be for the reason that so much of this work has to be done as shipments arrive at steel plants rather than prior to shipment.

Consider this illustration. Since the Bethlehem organization has been placed in war production, a type of operation such as the writer recently happened to see in progress at one of the important steel producing plants is a not uncommon sight. Thirteen men were segregating the different grades of alloy steel in six carloads of flashings. An electric magnet was expediting the work to a degree. But from the nature of the operation it was mostly hand work. At the outset the flashings were being sorted into 23 different piles. Detailed analysis of the various types of flashings identifiable by appearance, and reclassification according to alloy grades currently in production made it possible before the work was completed to reduce the number of separate piles to seven.

These six cars of flashings if properly segregated could easily provide 50 per cent of the alloying

By C. H. HERTY, Jr.  
*Bethlehem Steel Co., Bethlehem, Pa.*

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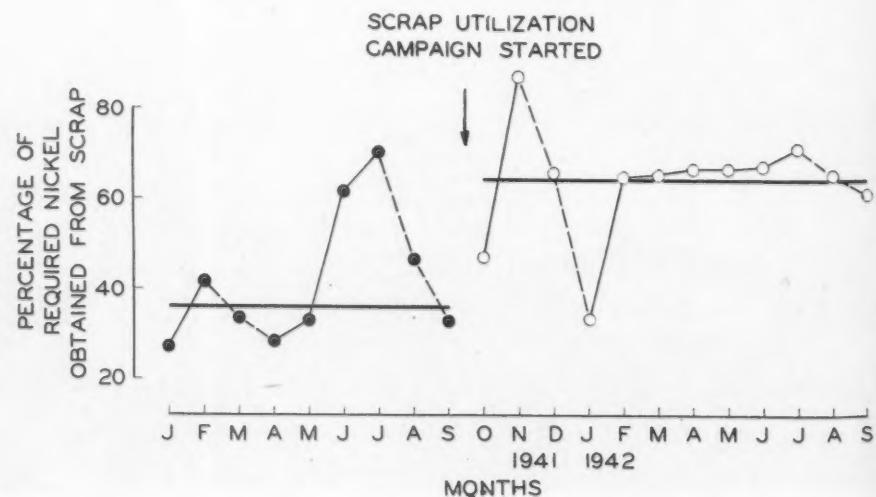
elements for 800 tons of alloy ingots. Unsegregated, their usefulness as a source of alloying elements would either have been greatly decreased or entirely negated.

The records that were kept on three comparative open hearth practices of a 1.85 nickel steel made under production conditions at a Bethlehem plant, will give an idea of the practical possibilities for conserving new alloys through increased use of scrap of known alloy content. Practice No. 1, which included a scrap charge totaling 50 per cent of the melt, made up half-and-half of revert mill scrap and non-alloy purchased scrap, yielded 37.7 tons of ingots of 1.85 nickel steel per 1000 lb. of added nickel. Practice No. 2, in which a good grade of heavy melting scrap containing nickel steel scrap was substituted for the non-alloy scrap, yielded 44.7 tons of ingots. But Practice No. 3, which utilized properly segregated nickel scrap plus revert mill scrap and new molybdenum ingots per 1000 lb. of nickel, or

almost double the production with the revert scrap as the only other source of nickel. Seventeen and three-tenths more tons of ingots per 1000 lb. of nickel were secured than when miscellaneous alloy scrap was used as a secondary source of nickel, and the ingot yield was 24.3 tons greater than when only mill scrap was used as the supplementary source of nickel.

Nickel, however, is only one of the present critical alloying elements that is readily recovered in properly segregated scrap. Similar efficiency in recovery can also be achieved with the common alloying elements, molybdenum, tungsten and cobalt. Chromium and vanadium, on the other hand, are oxidized in the steel making process to a large extent and their recoveries are low compared to those other elements mentioned except when special practices are followed in the production of certain grades of electric steel.

Just to indicate the possibilities in common everyday production open hearth practice, when only revert mill scrap and new molybdenum were employed as the alloying sources in heats of 0.20 molybdenum steel, 0.177 or all except 0.023 of the desired molybdenum



# Scrap Cuts Alloy Demands

had to be made up of new alloy. When purchased molybdenum bearing scrap was also utilized as a molybdenum source it was only found necessary to utilize new molybdenum for 0.13 of the desired 0.20 of molybdenum, decreasing the new molybdenum requirements 27 per cent.

These illustrations that have been given are conservative in their implications in relation to the actual over-all alloy steel production records at two of Bethlehem's steel producing plants. As has been indicated, reduction of the consumption of purchased alloying elements has been cut from one-third to two-thirds in two steel producing units.

The graphs reproduced below indicate the savings that have been made in use of new nickel as a result of increased utilization of segregated alloy scrap over a period of a year and nine months at these two plants. One graph shows the reduction in consumption of new nickel that has been effected at one plant since the early months of 1941 in terms of consumption of pounds per ton of new nickel for all nickel steels produced over this period. The other chart shows the percentage of the total nickel required that was obtained from scrap in all nickel steels that were

**... The new National Emergency steels are designed to take advantage of the alloy content of incoming scrap. So far, the full utilization of this technique has lagged. Here is the first report on how to segregate and utilize scrap, and thereby derive about 50 per cent of the alloying agents required.**

made at the other plant over a similar period. With abundant supplies of alloy scrap of known analysis such economies may easily be made in the conservation of existing sources of virgin alloying elements.

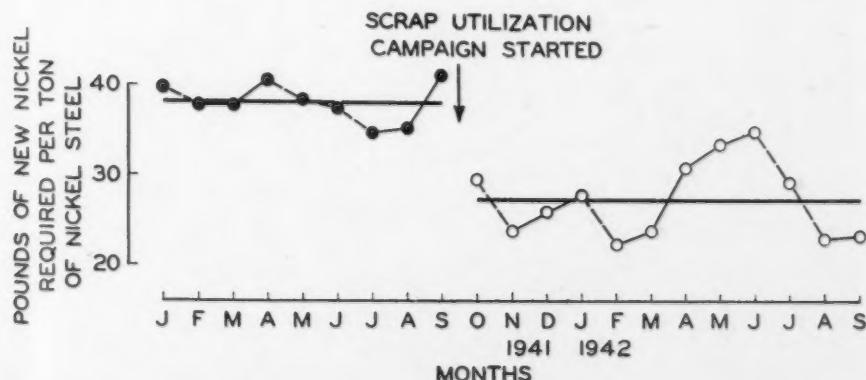
There is just one way in which maximum recovery of alloying elements from production scrap can be attained, namely, by segregation at its source of origin. In some cases larger establishments that are equipped with conveyor systems are achieving efficient segregation by scheduling removal operations of borings, clippings and other types of production scrap that are of different analyses at different times. Operators of all machines employing grades of an alloy steel that can go into a single classification collect borings and turnings or flashings, crop-ends or clippings at a specified time, and thus the conveyor system at these specified times carries production scrap of known analysis. In smaller estab-

lishments the same result can be achieved by providing separate boxes of different colors for the collection of the scrap from each machine.

With very few exceptions it is possible to perform segregation very simply at the plant at which the scrap is produced and with minimum expenditure of man hours. On the other hand, this work now so vital to the defense effort cannot at all be duplicated in many cases by scrap dealers or at steel plants after the scrap is once mixed together. Once it is mixed in no case can segregation be accomplished with as little expenditure of labor. Nor is it likely that as high efficiency can be achieved in alloy reclamation in steel making practice.

While WPB Order M-24-c in its present form calls only for segregation there will be a further gain in alloy conservation if light or bulky forms of scrap are given a certain amount of preparation. Many machine shops at the present time run borings and turnings through centrifugal separators to reclaim the cutting oil. Crushing scrap of this type reduces its bulk, and lowers handling costs. Well crushed turnings are readily charged in open hearth steel making practice with slight loss of the alloy content from oxidation. Preparation may be carried a step further by briquetting following crushing, further facilitating handling and likewise being advantageous in steel making practice. The balancing of light-gage cuttings and certain types of turnings is not only similarly desirable but essential to maximum alloy recovery.

Since the OPA has now estab-



lished premiums for properly segregated scrap such operations should readily pay their way. While investment in special scrap preparation equipment may not be immediately practicable for every shop engaged in war production, such a condition should not be permitted to become a hindrance to segregation. Alloying elements are at such a premium, and will count

so vitally in the war effort that as a nation we cannot afford to permit any waste of them that can be prevented. Ways and means can be found of getting properly segregated alloy production scrap to the open hearths even though for the time it cannot be also prepared at the source in the very most efficient form for handling and use.

The indications are that whereas at present about 35 per cent of alloying elements required by the steel industry's alloy steel production program can be derived from scrap, by a more general practice of segregation of alloy production scrap at its source at least 50 per cent of the alloying agents could thus be derived.

## Thermal Shock Detects Flaws in A.P. Shot

**I**N the manufacture of armor piercing shot, it is important that they be free from defects, cracks and flaws. To throw into bold relief any defects that may exist in the shell, a process has been developed for subjecting these shot to a thermal shock cycle. On conveyorized equipment the shot is first emersed in a cold water tank, then in boiling water and finally in cold water again. Flaws and internal stresses will reveal themselves in the shot, as shown in Fig. 1.



ABOVE

**F**IG. 1—Samples of shot after having passed through cold and hot water baths in shock testing unit. Shot at left is perfect. Shot at right has cracked because of internal defects.

• • •

RIGHT

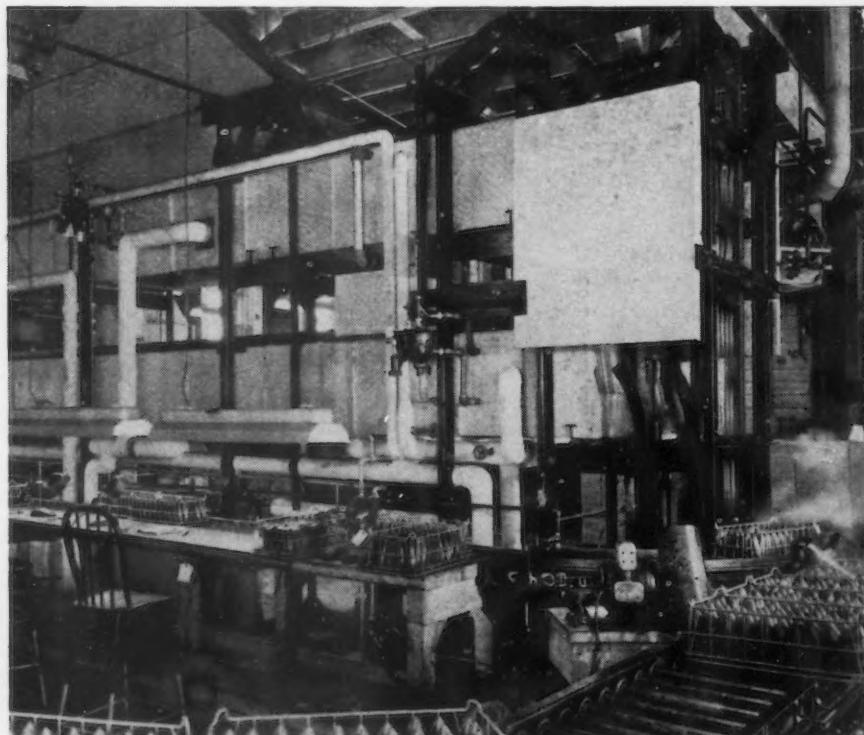
**F**IG. 2—View of shot testing equipment built by Conditioned Air Equipment Co. for a Midwestern ordnance plant. Inspection benches are in front of the hot and cold water tank units.

Fig. 2 shows an installation for shock testing 37-mm. shot in a Midwestern ordnance plant. The equipment was designed and built by the Conditioned Air Equipment Co., Minneapolis, and occupies a floor space of 26 x 26 ft. Requiring only the part time services of one girl to load and unload, the unit consists essentially of a conveyor system leading in and out of a series of insulated tanks holding cold and hot water. The shot is brought from room temperature to 40 deg. (specifications call for cooling below 60 deg.) in one water bath, is then plunged into a second bath with water at 212 deg. F. In a third bath it is brought down to 40 deg. again. From here it goes through a soluble oil bath to prevent corrosion.

Refrigeration for the unit is provided by a 5-hp. General Electric

condensing unit connected to an Acme cooler. The condensing unit, water cooling unit, and a circulating pump are mounted below the tanks. A standard G.E. gas-fired boiler supplies heat for the hot water tanks.

Similar equipment for shock testing shot has been designed by the Detroit Rex Product Co., Detroit. Both conveyorized and hand-operated machines are being built. The hot water tank is heated by use of either steam coils or gas immersion heaters, while the temperature of the cold water tanks is maintained by means of refrigerating equipment similar to that described above. These cold water tanks are provided with a circulation pump for the transfer of water between the tanks and the refrigeration equipment.



# Bonderized and Lacquered Steel Sheet

In a report from the chemical laboratory of the Metallgesellschaft A.G. Frankfurt am Main, printed in *Stahl und Eisen* of Aug. 13, and recounted in the *British Iron and Coal Trades Review*, L. Schuster reviews practical methods employed in Germany to provide a substitute for tinplate in the fabrication of food cans. In 1937, the DZ-Blechwarenvertriebs Ges. m.b.H., Leipzig, and the Fritz Züchner sheet-metal works at Seesen, proposed to the Metallgesellschaft that bonderized and lacquered cans be made, with the surface finish applied in the sheet-metal works, thus avoiding subsequent damage to the lacquered surface. Bonderized and lacquered cans were made from hot-rolled and cold-rolled, unlacquered sheets, which were treated after beading the bottom.

The bonderized coating consists of tertiary zinc phosphate with a small percentage of secondary and tertiary ferrophosphates, producing a crystalline skin intergrown with the surface of the iron. The coating is non-metallic and, according to W. Machu, contains 0.3 to 0.5 per cent pores similar to all phosphate layers, so that unless subjected to a finishing process the coating is not corrosion-resistant. Since bonderizing not only gives a more uniform phosphate layer but also enables coatings of different thickness and grain size to be obtained by a modification of the conditions of deposition, tests were made to determine the most suitable bonderized coating for black sheet cans. It was evident from the outset that with a single lacquer coating in comparatively thin layers such as used

... Recent German investigations, described here, indicate that a thin bonderized coating does not have much effect on lacquer deformability, slightly reduces impact resistance, and considerably improves boiling resistance and subsurface corrosion resistance.

on food cans, a thin fine-crystalline phosphate layer would be more satisfactory than thick coatings. Since the phosphate layer, being crystalline, is less ductile than the underlying metal, careful attention must be given to the physical properties of the bonderized and lacquered cans. In the bonderizing process used (No. 5), coatings of 0.0001 in. were laid down by 5 min. treatment, while No. 2 process, chosen as a basis of comparison, gave a zinc phosphate coating of 0.0004 in.

Cold-rolled sheets, 0.01 in. thick with four different surfaces, were used in the tests: (a) Plain, untreated surface, (b) sanded surface, (c) bonderized surface with 0.0001 in. phosphate coating (No.

5 process), and (d) bonderized surface with 0.0004 in. phosphate coating (No. 2 process). The (b) surface was prepared with quartz sand, its roughness being almost the same as that of the No. 5 surface (c). These sheets were treated with three different lacquers of the type already extensively used for coating black sheet.

The deformation factor was tested by the Niesen and Röhrs method in which an a.c. voltage of 10 is applied between the lacquered sheet and an electrode in a cell with a liquid conductor, the current flow resulting from the perforation obtained being measured. As long as the lacquer skin remains whole, no current flows; the current passing

(CONTINUED ON PAGE 86)

Solubility of Fe in Autoclave Tests. (Mgm. Fe dissolved.)

Type of Sheet	On Exposure to		
	0.5 Per Cent Lactic Acid	3 Per Cent NaCl	
	A	B	C
Bare.....	36	22	220
Sanded.....	25	18	220
Bonder 5.....	11	14	74

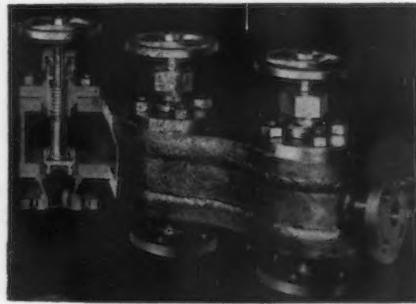
(1) 1 lb. can boiled at 248 deg. F. for 30 min.

# New Equipment . . .

## Plant Service and Safety Apparatus

New developments in fans and blowers, pumps, machinery cleaners, lubrication devices and fire extinguishers are described in this review of correlated products.

SIMPLIFICATION of valve and piping hook-ups is made possible through the use of welded manifold valves, as manufactured by Zallea Bros. & Johnson, Wilmington, Del. Any number of valves of any type in any size, of carbon or stainless steel, chrome iron, nickel, Monel or other alloys can be combined in an integrated unit to meet any requirement. Advantages claimed for welded valves include greater



strength with less weight, economy of space, ease of installation, minimum pressure drop and the elimination of bolts, gaskets and flanged fittings between individual valves.

### Acid-Resistant Fans

HIGH temperature acid-resistant fans of alloy steel, used on Despatch industrial furnaces and ovens for the past seven years, are now being offered to the trade by the Despatch Oven Co., Minneapolis. These fans are suited to most all heavy duty high-volume requirements involving temperatures to 1600 deg. F. Eleven sizes are available, ranging from 12 to 48 in. diameter wheels, handling total pressures to 10 in. of water. Outlet can be arranged in 16 standard positions. Belt drive is used on all models. Wheel is overhung and



shaft is supported on two large bearings, which are air-cooled; a patented device dissipates heat from shaft before it reaches bearings.

### Exhauster and Blower

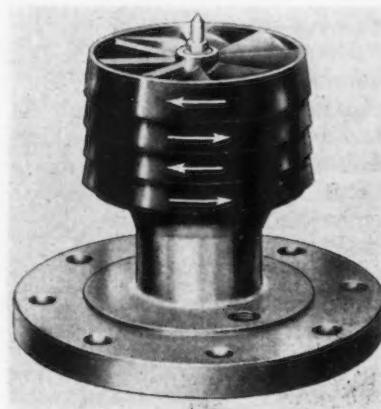
THE Octopus Jr., made by the Chelsea Fan & Blower Co., Inc., 1206 Grove Street, Irvington, N. J., is a small portable unit designed to eliminate gases, fumes, etc., from closed-in places, such as shipholds, welding rooms, tunnels, vaults and basements. The unit is powered by a  $\frac{3}{4}$ -hp. ball bearing motor and sucks or blows 2000 cu. ft. per min. It has adapters for three 4-in. nozzles or four 3-in. nozzles for flexible hose, with caps to close nozzles not in use. Each 4-in. metal hose



of 20 ft. lengths will exhaust 250 cu. ft. per min., and each 3-in. hose over 200 cu. ft. per min. The entire unit can be hung into a small manhole.

### Compressed Air Cleaner

THE present shortage of aluminum has caused the Logan Engineering Co., Chicago, to convert its Aridifier for compressed air lines to black, phenolic resin in place of aluminum. The Aridifiers, which are used to clean compressed air lines of moisture, oil and pipe scale, are now in production of plastic

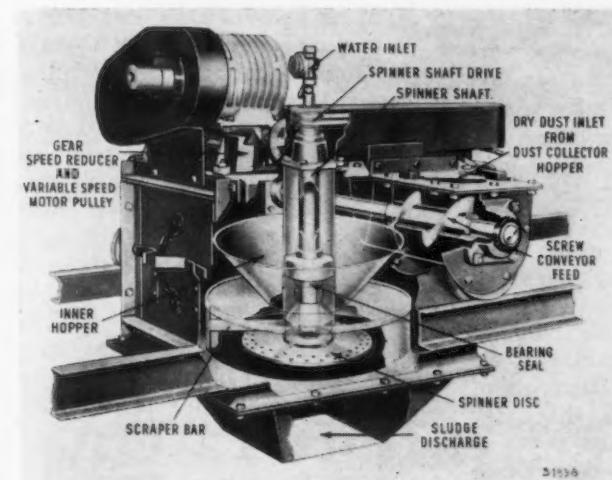


base with bronze inserts for the bearings. These rotors effect separation of moisture, etc., by means of opposed rotation.

### Machinery and Motor Degreaser

A PREPARATION for removing grease, grime and other accumulated harmful ingredients from machinery and machine tools of all kinds, together with a pressure gun, is offered by Davis & Murphy, Davis Building, Chicago. In operating the gun, a slight bending or flexing of the handhold opens the valve and allows the air to flow. This action syphons the cleaning solution into the gun where it is mixed with compressed air. The solution leaves the nozzle in a powerful and penetrating spray. When the intake hose is removed, the tool becomes an air drying blow gun.

## NEW EQUIPMENT



### Sludge Disposing Unit

A SCREW conveyor feed has been added to the American wet disposal unit to provide a constant and uniform rate of feed of discharged dust from dry type dust collectors into the sludge forming device. The unit, introduced by the *American Foundry Equipment Co.*, 555 S. Byrkit Street, Mishawaka, Ind., is designed to make a wet sludge of the dust discharged from the hoppers of dry type dust collectors. Dust which falls from the dust collector hopper through a flexible coupling is deposited directly into the screw conveyor. At the same time dust enters the unit, water or other liquid is discharged at the center of a high-speed mixing disk, causing an instantaneous mixture of the two. This sludge is then discharged at the bottom of the unit. Any desired consistency of sludge can be had merely by controlling the volume of dust and water fed into the unit.

### Rayon Rope Packing

AYON rope has been introduced by *E. I. du Pont de Nemours & Co.*, Wilmington, Del., to function as mechanical packing material to seal against the entrance or escape of water, brine, oil and other fluids. The rayon packing helps retain the high operating pressures of hydraulic shears, punches and presses. Collars of the rayon material fit snugly around shafts of accumulators which build up tremendous hydraulic power. The du Pont rayon tow, known as type 126, goes to manufacturers of mechanical

### Forced Induction Pump

THE new Lincoln portable forced induction pump, "50" series, is the latest addition to the line of "Pile Drivers" manufactured by the *Lincoln Engineering Co.*, 5701 Natural Bridge Avenue, St. Louis. Materials such as sealing compounds, sound deadeners, in-



sulating materials, putty, viscous grease, heavy lubricants, etc., can be pumped directly from the original container to the point of application with this unit.

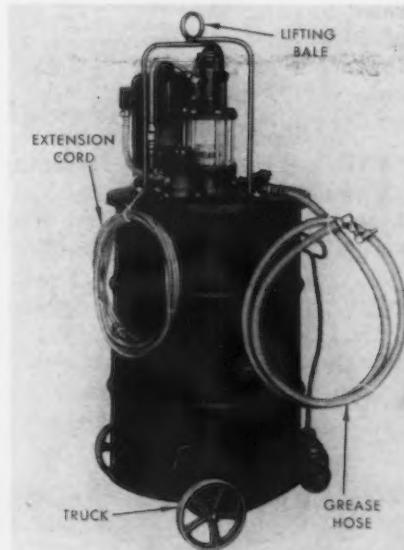
### Oil Absorbent Compound

QUIK-SIL, made by *Trojan Products & Mfg. Co.*, 3130 South Wabash Avenue, Chicago, soaks up wet oil on cement, wood and metal floors. Floors treated with Quik-Sil are said to be slip-proof, and free from sand and flying dust. It dries as it is shifted around and can be re-used. Discarded Quik-Sil makes a good sweeping compound for sweeping floors to allay dust on dry wood and cement floors.

packing and is braided and impregnated with lubricants. Usually the finished packing is square in cross-section and is installed in the stuffing box in a spiral coil. The smooth, unbroken filaments of rayon show very low abrasion to the metal shafts they enclose. They can be obtained in almost unlimited quantities.

### Barrel Pump

A SERIES H electric-hydraulic barrel pump has been introduced by *Trabon Engineering Corp.*, 1814 East 40th Street, Cleveland. These pumps are operated by plugging the extension cord into an electric outlet. The pump is mounted rigidly on a flanged head which fits snugly over a standard 55 gal. drum permitting oil, or light medium or heavy grease to be pumped from the original shipping container without rehandling. A lifting bail is provided permitting the unit to be transferred from one drum to another. A 1/2-hp. motor operates

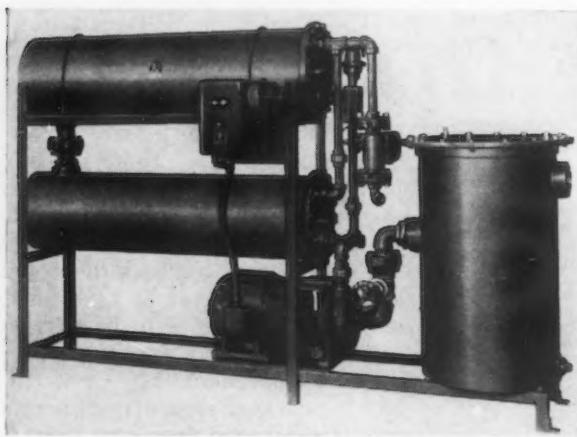


the pumps. The operation of the pump is controlled with automatic pressure switch. When the grease outlet is opened the reduced pressure in the line trips the switch, immediately starting the motor. When the grease outlet is closed, the pressure built up in the line again trips the switch, shutting off the motor.

### Quench Oil Strainer

A NEW kind of oil strainer, specifically designed for quench-oil cooling, is offered by the *Bell & Gossett Co.*, Chicago. In the illustration, this unit is shown attached to two interconnected B & G rapid oil coolers. These strainers employ two features which permit thorough cleaning of the oil without restricting free flow. First, they are amply sized to accumulate large amounts of scale before cleaning becomes necessary. Second, their screens are meshed to meet various operating conditions without clogging and yet affording full protec-

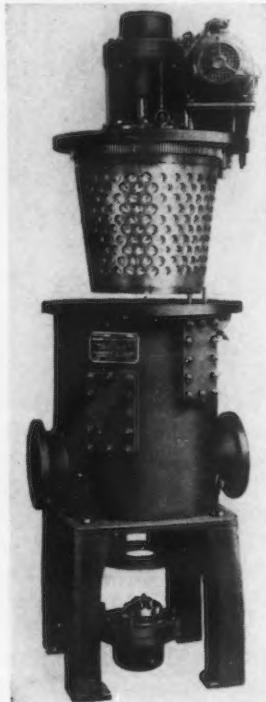
## NEW EQUIPMENT



tion to the pump. The strainer is rated to permit the maximum flow of oil which can be delivered if resistance is minimum in the suction line.

### Self-Cleaning Strainer

**T**HE Brassert self-cleaning water strainer, made by *S. P. Kinney Engineers*, 233 Oliver Avenue, Pittsburgh, is now built of



special materials for use in straining sea water, and also for service at coke and similar plants for straining ammoniacal liquor. The strainer, made in 3 to 30-in. pipe line sizes, consists of a slowly rotating conical drum, mounted on a vertical shaft, within a cast iron housing. The surface of the drum is drilled to receive the straining media which consists of porcelain disks, or flat or conical wire stainless steel screens.

### Fire Blanket

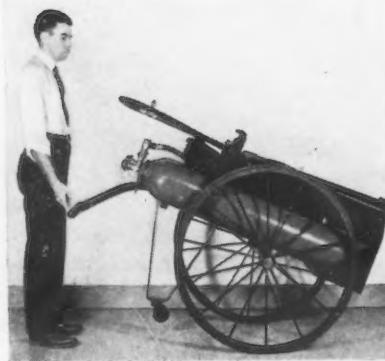
**T**HE Jomac fire blanket, made by *C. Walker Jones Co.*, East Germantown, Philadelphia, is a specially knit, flexible blanket that is 100 per cent flame proof, regardless of the intensity of the fire. These blankets are available in attractive, flame proof containers that may be hung on the wall beside fire extinguishers, in first-aid stations or in the equipment provided for air raid wardens. This blanket is designed for use in extinguishing fires in a person's clothing.

### Magnesium and Aluminum Fire Extinguisher

**V**-MAG-FITE is the name of a new material for extinguishing magnesium fires offered by *Metal Products Engineering, Inc.*, 4000 Long Beach Avenue, Los Angeles. It was developed in cooperation with one of the leading aircraft companies and has successfully combatted lathe fires occurring in that plant. These fire extinguishers are available in 2½ gal. size along with hose and cone type nozzle. They require 10 to 30 sec. to extinguish magnesium fires depending upon size. Residual flames are extinguished with CO<sub>2</sub> which is controlled by a three-way selector valve.

### Carbon Dioxide Engine

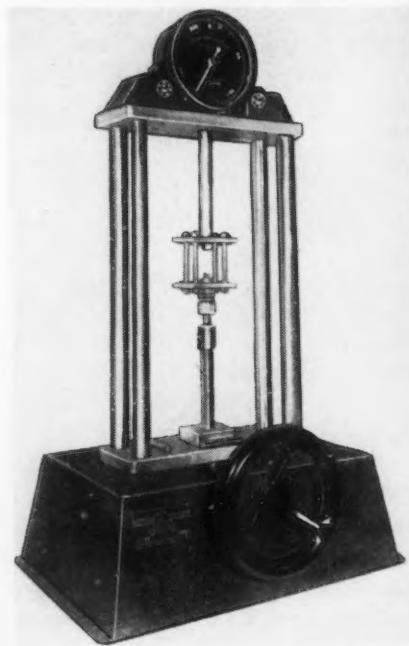
**T**HE Alfite carbon dioxide engine, offered by the *American-LaFrance-Foamite Corp.*, Elmira,



N. Y., is recommended for fires in flammable liquids, alcohol storage, electrical machinery, and for other class "B" and "C" fires. It quickly smothers fires with carbon dioxide gas which expands upon discharge to 450 times its stored volume. The unit is equipped with an Anti-Statik horn to protect the operator from static charge. It is designed for perfect balance at wheeling height, has a third swivel wheel for easy maneuvering, and a retaining latch which releases horn instantly, yet holds it firmly in place when not in use.

### Tensile Testing Machine

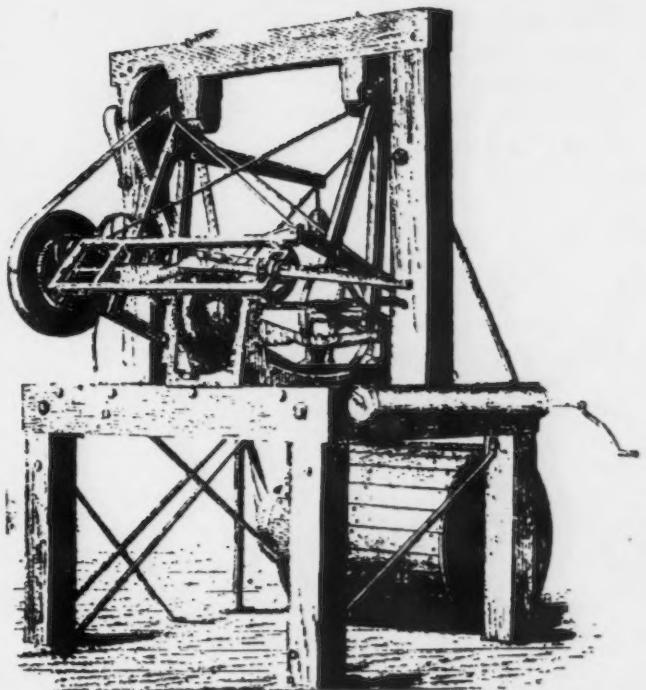
**S**EVERAL new features have been added to the table and floor model portable tensile testing machines manufactured by *W. C. Dillon & Co., Inc.*, 5410 West Harrison Street, Chicago, which greatly broaden the scope and utility of these testing units. The new table model can be used to check specimens up to 1 ft. in length and in widths up to 9 in. Its range is up to 10,000 lb. The versatility of this



unit is due to the use of the Dillon dynamometer stress indicator which permits wide limits of measurement with a uniformly small stress-reader. The table model is 32 in. high and the floor type is 72 in. high. Paper, plastics, rubber, wood, etc., may be readily checked for elasticity, etc., as long as their breaking point is between 0 and 15,000 lb., as a number of capacities are now available in this range.

# A Curious Machine

has lately been  
advertised that  
will churn, scrape  
Potatoes, rock  
the cradle and  
Darn stockings.



**T**HIS bit of early-American humor, which appeared in a New England newspaper more than a century ago, may well have been inspired by the "curious machine" shown here. It marks the beginning of a public awareness of the mechanical wonders ahead. Back in the days when "Industry" was spelled with an *i*, it was the birth notice of the Machine Age in America.

Picture the times when that notice appeared: Witchcraft was still a subject for serious dispute, and sane men believed that insanity was caused by Devils. Cocked hats and big-buckled shoes were still to be seen, and sober men declared the steam engine a passing idea, over their tankards of flip in the taverns. . . . The hammer and anvil were the symbol of the times, and every part of every musket or cannon or clock was made individually, by hand.

That was the setting. And in the midst of it, some of the greatest inventive geniuses the world has ever known were quietly changing the shape of things and of thought with the "curious machines" they were inventing. Such

curious machines as the one shown here. Machine tools, with which each part could be made in quantity, and precisely alike. . . . Tools that were to make machines that would churn, scrape potatoes, rock the cradles of industry, and even darn stockings!

**B**UT they were doing more of importance than inventing curious machines. Those men of mechanical genius were founding a handful of machine tool companies that have literally made possible all the rest of industry.

One of those companies — Jones & Lamson — is here today, a direct descendant of the first great machine tool builders in America. With a heritage of skills, knowledge and equipment that has constantly grown, from the very birth of our industrial age, Jones & Lamson engineers and service men are particularly qualified to serve any phase of industry today and during the difficult period of post-war readjustment ahead.

Jones & Lamson service is at your service now!



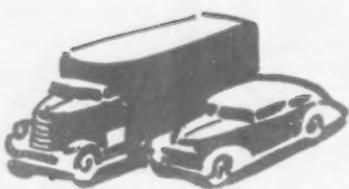
**JONES & LAMSON**  
MACHINE COMPANY  
SPRINGFIELD, VERMONT, U. S. A.

*Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers.*

**Profit Producing Machine Tools**

# Assembly Line . . .

• Chevrolet is building cargo plane engines as well as bomber motors; has four plants forging and casting aluminum and magnesium parts, and a fifth one planned . . . Detroit program for job stabilization gets under way.



**D**ETROIT—Without fanfare the Chevrolet Motor Division of General Motors Corp. has moved rapidly into the production of cargo plane engines, adding this activity to its already noteworthy output of bomber type motors. Attention is thus directed to Chevrolet's accomplishments in converting from its activity as the largest producer of cars and trucks in the world to one of the most important armament manufacturers.

Although the cargo type engine is quite similar to the bomber motor, no small degree of new undertaking is involved in it. There are 316 parts required which are not manufactured for the bomber type engine, and relocation of several important components is necessary.

Schedules for production of the cargo type motor call for considerably more manufacture than was set up in the original Chevrolet program on the bomber type motor, the P&W 1830, which continues in production in most substantial volume.

Assumption of the entire cargo engine program follows upon a very outstanding record which Chevrolet made when it first went into the aircraft engine manufacturing field. The first Pratt & Whitney motor was produced 25 days less than a year from the time of the contract award. Since that time volume has increased appreciably, almost by the week. At the same time, the company, through installation of manufacturing economies, has been

able to cut the price of these motors to the government by approximately 30 per cent.

This work on both bomber type and cargo type plane motors is centered in a group of three plants in the East. The parts for this final assembly work flow from output scheduled at nine other Chevrolet plants located in Michigan and Indiana.

Chevrolet has another huge stake in the recently enlarged aircraft program, through its production of aluminum forgings and magnesium castings.

One of the largest aluminum forging plants in the country has just gone into service in Michigan, capable of producing approximately several million pounds a month. This unit turns out forgings for propeller blades, propeller blade pistons, aircraft crankcases, engine pistons and other parts.

The amount of equipment installed in this new forge plant is indicative of its size. A large battery of hammers range from 1500 lbs. to four 35,000-lb. Eries. There

are upsetters, 8-in. Ajaxes and 7½-in. Nationals. No. 5 Ajax forging rolls are in the plant. In addition, there are a considerable number of presses, including one 3000-ton hydraulic press, several No. 8-60 Bliss presses, hydraulic straightening and Toledo trimming presses.

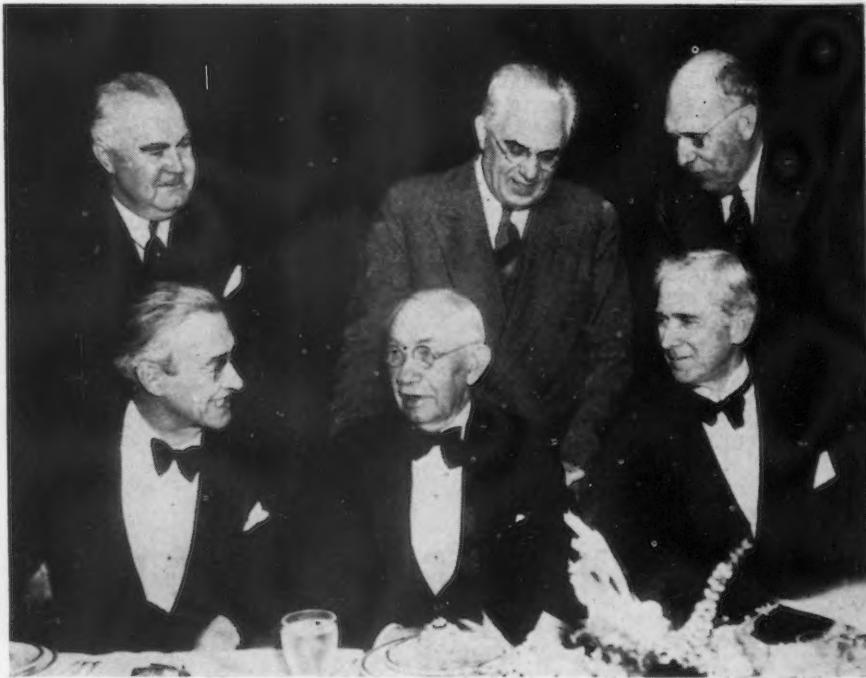
In Indiana, another aluminum forging plant is heavily engaged in manufacturing pieces for crankcases, landing gears, pump gears, engine and bomber parts of varying sizes and uses. Equipment here includes three 25,000-lb. hammers, together with such equipment as furnaces, presses, scales, etc.

In a third forging plant Chevrolet is producing aluminum piston forgings, several hundred thousand pounds of them a month.

In addition is a program aimed at converting an old plant in another Indiana city into an aluminum forge. This set-up is designed around a new system of forging, pressing and upsetting cylinder heads which eliminates the need of new equipment which would otherwise be required. Very satisfactory operations are anticipated as an outcome of this new method, even though tensile strength of the

**AVIATION PIONEER:** William B. Mayo, one of the nation's leading aircraft pioneers who built the Ford Tri-Motor plane as manager of the Ford Motor Company's Aviation Div., was honored by other veterans in the automotive and aviation field as Mr. Mayo nears his 77th birthday, on Jan. 7. Shown here, left to right (seated): William B. Stout, William B. Mayo and J. Lee Barrett, president of the Detroit chapter of the National Aeronautical Association. L. to r. (standing): Fred M. Zeder of Chrysler Corporation; Senator-elect Homer Ferguson of Michigan, and Charles F. Kettering of General Motors Corporation.

World Wide Photos





The Army-Navy "E" for excellence means to the Bullard workers that they are Industrial Soldiers backing up the Armed Forces — those Soldiers at the front.

Such a spirit of true Americanism reflects itself not only in speeded-up Production but also in the workmanship which goes into every Bullard Multi-Automatic and Vertical Turret Lathe. They're built to do the jobs faster and more accurately so that the boys at the front may have confidence in the tanks, guns, planes, and other equipment which Bullard machines have helped to build.

**BULLARD COMPANY**  
BRIDGEPORT, CONNECTICUT

**BULLARD**

## ON THE ASSEMBLY LINE

forgings will be very slightly reduced under the new process, and porosity will also be modestly affected.

This plant will produce cylinder heads for aircraft. It appears that it will be one of a group turning out the bulk of the enlarged requirements for these parts.

**A**NOTHER new activity at Chevrolet in the metal fabrication field are the operations which are now being started up in Michigan in a new magnesium foundry. Schedules call for the pouring of a large quantity of castings during January, and this volume will be multiplied later during 1943.

This plant sets up some interesting innovations in foundry practice. Customary magnesium foundry procedure calls for heating to 1200 deg. F. in the tilting furnaces and raising the temperature to 1600 deg. in super-heating pots, which permits cooling to 1500 deg. or so during the pour, all of which creates unavoidable fire hazards with this highly inflammable metal. To minimize this hazard, and to cut down spread of sulphur fumes as well, all these operations are conducted at the new Chevrolet plant in a melting room walled from the rest of the foundry. A conveyor moves through the wall, bringing the molds to the melting room for pouring. After pouring, these molds are returned through the wall to the shake out, a distance sufficient to allow the castings to set. The conveyor return operates under a hood to prevent sulphur fume hazard.

Quite naturally, Chevrolet is engaged in a substantial military truck program, an effort partially geared to the output of Yellow Truck and Coach Manufacturing Co. Present truck output is providing a substantial number of 4x2 and 4x4 assemblies. In addition to these, Chevrolet is building large quantities of axle sets for 6x6 trucks manufactured by Yellow Truck, plus motors for these jobs, sheet metal and transfer cases. On top of that, Chevrolet is utilizing two erstwhile passenger car assembly plants to assemble about half of the overall 6x6 production.

The company has been one of the largest manufacturers of 75 mm. shells—a job on which it was consistently ahead of schedule and on which, equally noteworthy, the cost was cut to the government to little

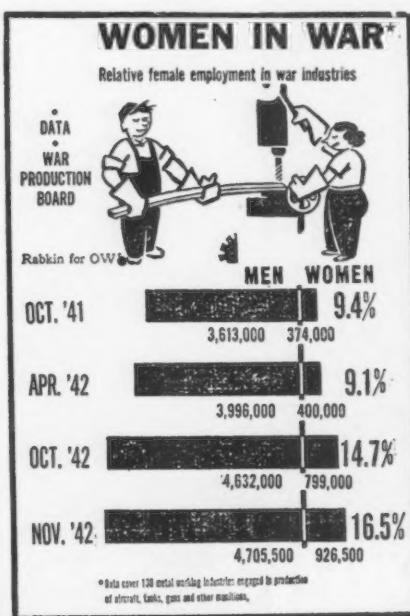
more than half of the original going quotation, which had been based on government estimates. This output is now being switched to the manufacture of 3-in. shells.

Also being turned out is 75 mm. armor piercing shot, produced from steel. Chevrolet is doing a considerable amount of machining of 90 mm. anti-aircraft and anti-tank guns, using a former sheet metal plant to process tubes, breech rings, breech locks, recoil rails and tube supports.

Such are the major phases of Chevrolet's war manufacturing program. But there are others of equal importance in the war effort, despite their smaller volume. As example, in one of its plants Chevrolet is heat-treating all of the armor plate it requires for a portion of its program.

Essentially a prime contractor, Chevrolet is acting as a sub-contractor for 38 outside manufacturers and is supplying parts to 25 corporation affiliates. Its sub-contract output for other prime producers ranges all the way from tank track lugs up to major aircraft sections.

**T**HE job stabilization plan of the Detroit District War Manpower Committee is now in motion, starting up after the new year came in with approximately 500 cases scheduled for hearing before representatives of the United States Employment Service. Initial indications of the Detroit WMC plan were that good latitude of flexibility and movement from job to job is possible under its provisions.



Initial job releases authorized by the reviewing board were based mainly upon difficulties in transportation inherent in reaching present jobs and upon evidence of disuse of highest worker skills. The reviewers were astonished by one of the first cases they heard, that of an employee at the Dodge Truck Plant who hitchhiked 84 miles a day to and from work as the only means he has of getting to his job on time. He was authorized to request a release from his employer which will enable him to go to work at the Willow Run Bomber plant, thus saving him 44 miles a day in transportation.

Another release was granted to a lathe operator who earns 80c. an hr. today although he sets up his own work and checks it. In this case the worker has no alternative job in view, but release was granted on the ground of inequitable pay.

The first appeal from the USES panel decision was filed by a chemical still operator now obtaining \$1.01 an hr. who had a job in view as an aircraft bench work man, for which he expected to receive \$1.15 an hr. Having only a 60-hr. training course to qualify him for the aircraft work, and no experience in actual production of the sort, he was refused a transfer on the grounds that the 14c. differential did not justify his abandoning a job in which he had a five-year backlog of experience. The appeal goes to the Manpower Commission.

As the system appears to be shaping out, the review unit will require a worker to wait five days after any ruling is issued in his favor before he can obtain his release, during which the employer can appeal to the District War Manpower Commission. Speeding up of the process was also anticipated so that any employee refused a release would be able to appeal within a week. Employees are being asked to contact their employers for release slips, utilizing their unions if practical, before appearing before the USES board, as a means of reducing the work of that panel.

At the same time, the Detroit Manpower Committee indicated that it would not be too lenient over the matter of transfers by saying that if quits increased noticeably in volume, a plan might be instituted similar to that of Louisville, Ky., where releases may not be obtained for 30 days in cases where workers leave essential jobs.



## ...without cutting power

Moving machinery—changing shop set-ups—is an everyday job in modern war plants. But it's a quick and easy job in plants equipped with sectionalized, prefabricated "plug-in" Bus Duct.

No cutting, taping or other fabrication is necessary in making the original installation—or in changing the location of a machine or a whole production battery.

Just move the circuit protective "plug" right with the machine, mount it on the Bus Duct at the "plug-in" opening nearest the new location—and the job is done without cutting power, interrupting production, or taking the dangerous alternative of tapping in "hot."

All through America's non-stop production drive Bus Duct is saving countless man-hours, multiplying efficiency, protecting against fire and sabotage, safeguarding human life . . . and all this with a minimum use of critical materials.

Modern Bus Duct is an integral part of the machine tools it serves. Small wonder that it has become a *necessity* in present-day mass production.

BUY MORE WAR BONDS—SALVAGE ALL SCRAP METAL



BULLDOG "PLUG-IN" SYSTEMS—THE ARTERIES THAT SUPPLY POWER  
AND LIGHT FOR WAR PRODUCTION

# Washington .

• President Roosevelt expected to act soon to prevent passage of Pepper - Kilgore - Tolan bills which would establish a "supermobilizer" . . . Board composed of all war industry czars may be set up, with President acting as referee.



**W**Ashington—The President is expected to try to straighten out the troubles war agencies have gotten themselves into with Congress by the signing of one or more executive orders soon to prevent the passage of the Pepper-Kilgore-Tolan bills. The congressional bills provide for a civilian high-command headed by a supermobilizer to have jurisdiction over all of the various "czars" which have been appointed. It is reported that the President opposes the creation of a new agency and would become the supermobilizer himself.

While the capital buzzes with political high-jinks, with increased intensity now that Congress has convened, an outstanding plan by which it is hoped to increase steel production from 10 to 15 per cent by product concentration is gaining favor and being pushed more and more by high-ranking Administration circles.

Steel production concentration, it is said, if adopted, cannot be reduced to a fixed formula. Methods would have to vary with objectives. Suppose it were desired to increase the tempo of plate production and insure that plate production was not interfered with in plants designated "A" and "B." "A" company couldn't make cold rolled and galvanized sheets without interfering with plate production, for instance. "B" company could. "A"

company would be forbidden to make the sheets, with its production of these products transferred to another company—not necessarily "B" company.

**T**HE advantages gained would not work a profit penalty on "A" company. Some of the highest officials are considering the distribution of profits to companies whose production of various products would be withdrawn. The gaining companies would have to share profits.

The WPB Steel Division recognizes the concentration principle and has in some cases shifted long terne plate and galvanized sheet orders from integrated mills to non-integrated companies, whose rolling equipment covers a much narrower range than the integrated mill.

Strong belief in Congress and among observers here that the White House will seek to short circuit congressional intervention is borne out by the stories on a projected reorganization of the entire government. On one day it is reported that the President will form a new four-man war cabinet and on the next that he will appoint Economic Czar James F. Byrnes to set up a superboard composed of all the war industry czars. Included in this group of czars would be Rubber Czar William Jeffers, Donald M. Nelson for WPB, ODT Chief Joseph B. Eastman and Mar-

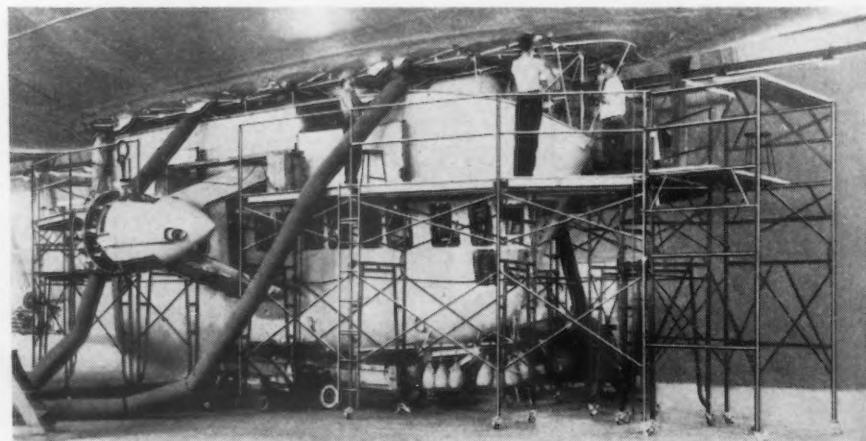
itime Chairman Admiral Land. This reorganization generally follows the pattern set up by the Pepper-Kilgore-Tolan bills.

At one time it was planned to remove the Office of Civilian Supply from WPB control and put it under the wing of Mr. Byrnes. Persistent rumors in high places that rationing will be taken away from OPA, given to OCS, or set up in a new separate agency are so definite to make it certain that something like this will be done.

**T**Hese stories reflect White House desires, since they stem from war agency sources such as WPB and high administration officials. It is questionable, though, whether Congress will be satisfied with whatever emerges to prevent it from going on with its purge started with the plowing under of Price Administrator Leon Henderson. The targets of the Pepper-Kilgore-Tolan bills are said to be Undersecretary of War Patterson and Lieut. Gen. Breton B. Somervell, since a civilian high command is demanded by Congress. Nevertheless, there are strong forces both in Congress and in executive agencies who support both Secretary Patterson and General Somervell as unusually able administrators.

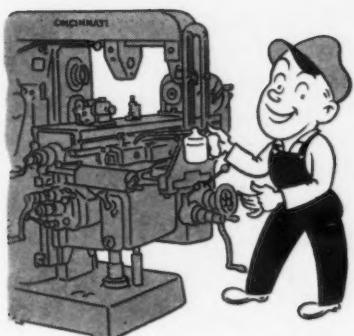
But, the four-man war cabinet and the super-board stories are labeled as too pat by experienced observers to be what the President

**BLIMP ASSISTOR:** Attaching the gondola to the bottom of the big Goodyear blimp was always a problem of horses and planks until the Safway Steel Products, Inc., designed and furnished this all steel scaffolding which is now used. It is said to be a time saver which is expediting the production of blimps for our armed forces in the plants of the Goodyear Tire & Rubber Co.

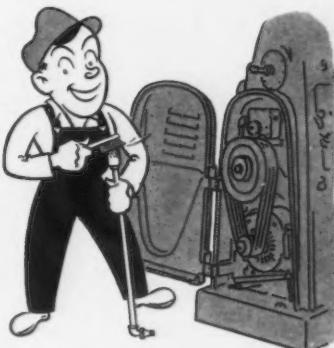


# A LITTLE EFFORT NOW... May Save Days of Production Later

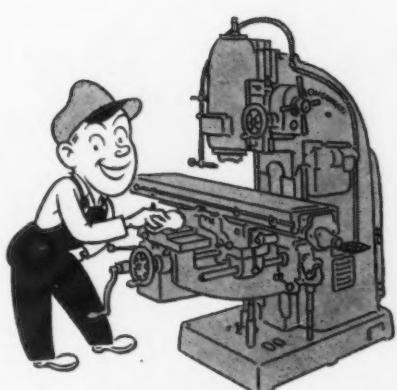
No. 1 of a series of articles pointing out the necessity of routine attention in keeping mechanical equipment in operating condition. This article covers the CINCINNATI Dial Type Milling Machines.



Oil your machine at the beginning of each shift. Periodically drain oil reservoirs and refill with clean oil, every two to four months—not over six months while running one shift. An oiler working from a lubrication department will do a better job. Follow printed instructions, (publication No. M-1084-2.)

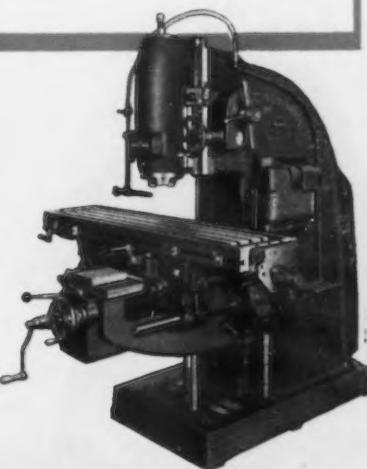


When using coolant, clean the intake strainer occasionally. Use plenty of coolant to avoid burning cutters.



Using a soft rag, wipe exposed bearings clean twice a day. Top of knee (front and rear). Face of column and knee dovetail (above and below knee). Dovetail under table (both ends). Dovetail under over-arm (horizontal machines) and vertical head ways (vertical machines). Oil these surfaces after wiping them clean.

- Like any mechanical equipment, machine tools require routine attention to keep them running. CINCINNATI Dial Type Milling Machines are designed to counteract many of the tendencies of operators and service supervisors to overlook or neglect this routine attention. Catalog M-970-1 describes all these features of long life, in addition to listing complete engineering specifications. You may obtain a copy by writing to the address given below.



CINCINNATI

THE CINCINNATI MILLING MACHINE CO. CINCINNATI,  
OHIO, U.S.A.

DOOL ROOM AND MANUFACTURING MILLING MACHINES... SURFACE BROACHING MACHINES... CUTTER SHARPENING MACHINES

## WASHINGTON NEWS

will do. It is pointed out that Mr. Roosevelt does not adopt advertised subtle plans to accomplish his ends. The Interior - Labor - War Manpower cabinet triple play reported last month by labor sources which never came about is an example.

Consequently, when it was learned that a third plan to stymie Congress is being considered at the White House—a much more obvious move in keeping with the President's own ideas about what is subtle—more credence attaches.

**S**IMPLY, Mr. Byrnes, War Manpower Chief Paul McNutt, Donald M. Nelson, WPB Chairman, OCD Director James M. Landis, Harry Hopkins, FWA Administrator Philip B. Fleming and NHA Administrator John B. Blandford who have come to cabinet meetings by invitation during the past year may now come to special weekly meetings. They may be joined by the soon-to-be-appointed Price Administrator, together with Messrs Jeffers, Eastman and Land. The list may be expanded to include such cabinet members as the Secretaries of War, Navy, Interior and

Agriculture in their claimant agency capacities. Other claimant agency heads may be requested to be present. They are: Edward R. Stettinius, Lend-Lease; Henry Wallace, Board of Economic Warfare; Charles E. Wilson, Aircraft Scheduling Board; Joseph Weiner, Office of Civilian Supply; and an unnamed representative of the WPB Facilities and Construction Bureau.

The country's military and production problems will be considered. Officials whose programs conflict will speak their pieces before the President who will act as referee on the spot. It is expected that the fact that officials will have to meet together weekly will discourage jurisdictional and policy disputes.

Also, Mr. Roosevelt, allegedly, will settle the War Department-WPB production dispute allowing the Army to keep its production powers in law, but seeing to it that WPB gets them in fact. It will look like an Armed Service victory, it is said, but will prove to be a compromise leaving both sides satisfied. Whether Congress will be satisfied is another question.

### THE BULL OF THE WOODS

BY J. R. WILLIAMS



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THE SLEUTH

1-15

### Cited for Award

• • • The following plants have recently been cited for outstanding performance on war work, and have been awarded the Army-Navy "E" production pennant:

Adams & Westlake Company, Elkhart, Ind.

Aetna Ball Bearing Mfg. Co., Chicago.

Aircraft Fitting Co., Cleveland.

American Cyanamid Co., Calco Chemical Division, Bound Brook, N. J.

Anaconda Copper Mining Co., Anaconda, Mont., and Anaconda Reduction Works, Great Falls, Mont.

Army Map Service.

Cinaudagraph Corp., Stamford, Conn.

Columbia Steel Co., Pittsburgh Works, Pittsburgh, Cal.

Continental Rubber Works, Erie, Pa.

DeJur Amsco Corp., Shelton, Conn.

Detroit Broach Co., Inc., Detroit.

Eli Lilly & Co., Indianapolis.

Fairchild Engine & Airplane Corp., Airplane Division, Hagerstown, Md.

Felters Co., Inc., Millbury, Mass.

Ferro Enamel Corp., Cleveland.

General Asbestos & Rubber Division, Raybestos-Manhattan, Inc., North Charleston, S. C.

Guy P. Harvey & Son, Leominster, Mass.

Horni Signal Mfg. Co., New York.

Inland Steel Co., Indiana Plant, Indiana Harbor, Ind.

International Harvester Co., St. Paul Works, St. Paul.

Jones & Laughlin Steel Corp., Aliquippa plant, Aliquippa, Pa.

Keystone Trailer & Equipment Co., Kansas City.

Mack Molding Co., Wayne, N. J.

Macwhyte Co., Kenosha, Wis.

Charles Mundt & Sons, Jersey City.

W. C. Norris, Mfr., Inc., Tulsa, Okla.

Pitney-Bowes Postage Meter Co., Stamford, Conn.

Pittsburgh Coke & Iron Co., Neville Island Plant, Pittsburgh.

Quincy Barge Builders, Chicago.

Ranco, Inc., Columbus, Ohio.

Republic Steel Corp., Birmingham Division of the Gulf Steel Division, Thomas Station, Birmingham, Ala.

Republic Steel Corp., Gadsden Plant of the Gulf Steel Division, Gadsden, Ala.

Republic Steel Corp., Central Alloy District, Canton, Ohio, and Massillon, Ohio.

Reynolds Spring Co., Plant No. 1, Jackson, Mich.

Rohm & Haas Co., Bristol, Pa.

Russell Mfg. Co., Middletown, Conn.

Servel, Inc., Evansville, Ind.

Shell Oil Co., Inc., Wood River Refinery, Wood River, Ill.

Standard Brands, Inc., Peekskill Mfg. Branch, Peekskill, N. Y.

Stanley Works, Main Plant, New Britain, Conn.

Swift & Co., Chicago.

Sylvania Industrial Corp., Fredericksburg, Va.

Tennessee Coal, Iron & Railroad Co., Bessemer Rolling Mill, Bessemer, Ala.

Ensley Works, Ensley, Ala.; Fairfield Steel Works, Fairfield, Ala.

United States Rubber Co., Mishawaka Plant, Mishawaka, Ind.

Vard, Inc., Pasadena, Cal.

Weaver Mfg. Co., Springfield, Ill.

Willys-Overland Motors, Inc., Toledo, Ohio.

MARITIME COMMISSION "M"

Tube-Turns, Inc., Louisville, Ky.

Delta Shipbuilding Co., Inc., New Orleans.

MARITIME COMMISSION "M"

American Locomotive Co., Dunkirk, N. Y.

Superior Engine Division, National Supply Co., Springfield, Ohio.

Cooper-Bessemer Corp., Mt. Vernon, Ohio, and Grove City, Pa.

Davis Engineering Co., Elizabeth, N. J.



## NEW LIFE for SHELL FORGING DIES

## SUN LUBRICANTS

**Reduce Shutdowns • Increase Die Life • Halve Cost of Lubrication!**

Ammunition for the big guns of our fighting men takes top rating in "urgency" . . . and Sun Lubricants are helping many munitions makers to "deliver the goods" ahead of schedule.

About ten months ago, one of the country's largest producers of 75 m.m., 105 m.m. and 155 m.m. high-explosive, armor-piercing shells switched to Sun's Circo XXX Heavy Oil as a die lubricant in the forging operation. The results have been remarkable . . . with die life increased beyond all expectations . . . lubricant costs cut in half . . . and shutdowns, due to failure of dies and piercing points, practically nil.

These shells are forged at high temperature by the

standard upsetting and bulldozing methods. Circo XXX Heavy Oil, applied to the dies by swab at intervals of every third forging, burns clean . . . produces no scale that may mar the finish of the forging.

This is but one of thousands of instances in which Sun Oil Engineers and Sun Lubricants are helping Industry to speed the flow of vital war products. Let a Sun "Doctor of Industry" help to speed up your production . . . and cut costs at the same time. He will be glad to study your lubrication problems and make complete recommendations. Write

**SUN OIL COMPANY, Philadelphia**

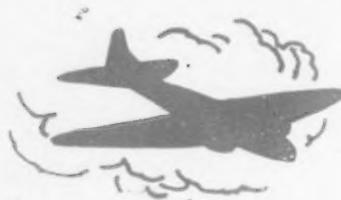
\* Sun Oil Company, Limited . . . Toronto, Canada



**SUN PETROLEUM PRODUCTS** **HELPING INDUSTRY HELP AMERICA**

# WEST COAST . . .

- 1943 aircraft production goals will require facilities expansion . . .
- Kaiser-Union dispute aired . . . WLB trying to reconcile aircraft and shipyard wages . . .
- West Coast scrap boom becomes controversial situation.



**L**OS ANGELES—That aircraft production goals for 1943 will not be reached without some expansion of plant facilities even though maximum utilization of the present production is counted on to make most of the airframe manufacturing spurts, is becoming apparent little by little.

Announcement that Consolidated Aircraft Corp. will take over and complete the New Orleans plant originally to have been operated by Nash-Kelvinator—one of the plants which got the axe under the stop-construction order months ago—is evidence that the peak of material demand for the facilities program has passed sufficiently to allow some relaxation of the ban on new plants. Consolidated states that the Gulf plant will build a new model Navy patrol bomber, specifications not announced. The outstanding record of the Catalina series, whose design was one of the first to be frozen among American planes and which was making war history long before America's entry, makes it entirely logical that Consolidated be chosen to harvest the fruits of its experience in this department. Capt. William Nelson, who recently completed setting up a string of sub-assembly shops for Consolidated in small California cities when the labor situation became critical in San Diego, will be acting division manager of the new project.

Defense Plant Corp. also has

made provision for additional plant facilities for North American Aviation in Texas to the tune of \$1,250,000 and for a small Douglas California expansion.

One of those secrets which no more than a few million southern Californians have known about for sometime became public information last week with Army authorization of the announcement that Timm Aircraft Corp. is one of the 15 concerns throughout the nation responsible for the stub-nosed, long wing gliders which have been tugged over this section by twin engine military transports. Very evidently planned with an eye on mass production, the motorless aircraft accommodate 15 armed troops. The welded steel tube fuselage is built in three sections, while the plastic plywood wing is assembled from four separate panels.

Credit for a production increase in Army B-24 bombers of 200 per cent in the last year at Consolidated's San Diego plant is given by Harry A. Woodhead, company president, to the powered assembly line which, a few months ago, lit a fire under production at the plant. With Ford, Douglas and North American officially announced as participating in the B-24 program, a healthy rivalry should develop among these plants insofar as they operate on a comparable basis.

Material exchanges among members of the Aircraft War Production Council, Inc., which includes the eight larger southern California airframe manufacturers, has passed the 10,200 mark, all on the basis of emergency, the Council announced at its December meeting. Exchanges of technical engineering information among the member companies numbered 1075. The Council has also worked out a basis of exchange of production information with the Aircraft War Production Council, East Coast Inc. and the Automotive Council for War Production, both of them somewhat younger proto-types of the West Coast group.

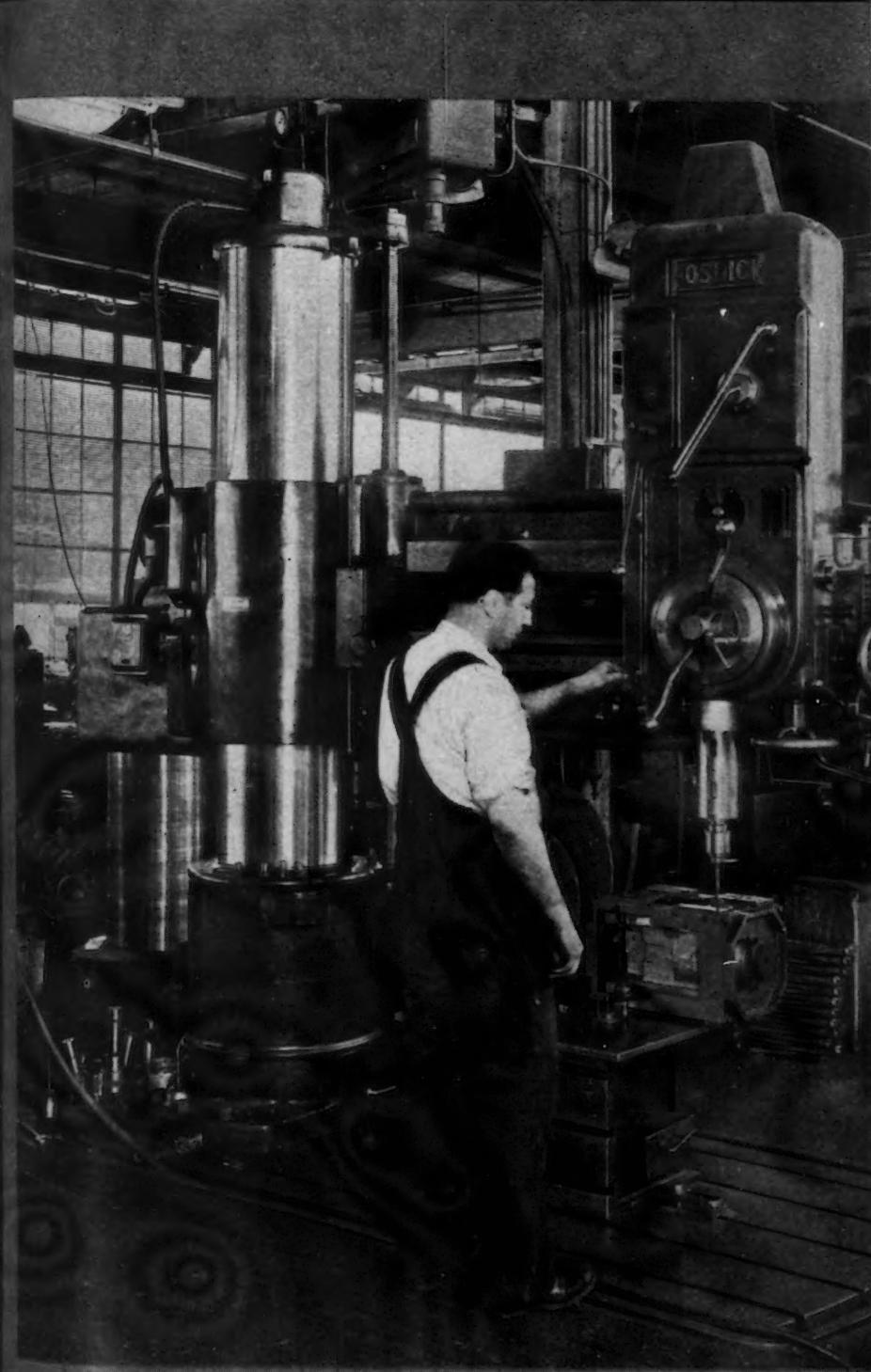
**C**Hoice of Edward C. Wells, Boeing's old head on young shoulders, to receive the Lawrence Sperry Award for 1942, awarded for "notable accomplishments by

young men in the advancement of aeronautics" means that the Flying Fortress has brought home honors again, this time to one of its principal designers. Wells joined Boeing's engineering staff at the age of 20, following his graduation from Stanford University, and was set to work on preliminary design in the experimental department. At 23, he became assistant project engineer on the Boeing "299" which later evolved into the Flying Fortress, and later was responsible for the exhaust - driven turbo - supercharger as well as the basic design. In 1938, at the ripe old age of 27, Wells was assistant engineer in charge of military projects and, growing up with the job, became assistant chief engineer for the entire company the next year. Although the industry has the reputation of youth, and although many of the operating departments are manned chiefly by younger men, this achievement in the field of design by an engineer with less than ten years' background of technical training and experience is extremely noteworthy.

The big news in the Pacific Coast aircraft industry, as this is written, is being made at Washington, D. C., where the War Labor Board is considering recommendations on pay and working conditions at nine far Western airframe plants. The recommendations, which have constituted the chief topic of conversation for sometime among the multitude of workers assembling planes in southern California and Seattle, were the result of panel hearings conducted several weeks ago under the chairmanship of Paul R. Porter. From the wage standpoint, the broad issue is whether the aircraft industry, or any industry so conceived and so dedicated, can long endure side by side with the Coast shipbuilding industry whose wages have been stabilized and frozen on a considerably higher level. For a slightly longer work week, average weekly earnings in the California aircraft industry during November were \$44.43, compared to average earnings by shipbuilders of \$62.82. Employees, represented variously by AFL, CIO, and even an independent union, have contended that

CAPACITY FOR LARGE HOLES...  
ACCURACY FOR SMALL...  
SPEED FOR BOTH...

# Fosdick Radials



• In hundreds of shops engaged exclusively in war production Fosdick Radials are speeding production — maintaining accuracy — and saving vital time.

These sturdy Radials have the stamina and power for drilling large holes accurately — the rigidity to maintain close tolerances on smaller diameter holes — a full selection of speeds and feeds quickly available in the head to assure the maximum of production.

No matter what your job may be if it can be done on a Radial—put it on a Fosdick Hydraulic Economax for accuracy—speed and low costs. Built in sizes 4 foot, 11" column to 8 foot, 19" column.

Our fully descriptive bulletin R.A. Radial Drill will be sent on request.

**FOSDICK MACHINE TOOL COMPANY**  
CINCINNATI . . . OHIO

## NEWS OF THE WEST COAST

this disparity constitutes evidence of a sub-standard condition hindering the war effort which makes them eligible for a considerable raise even under the terms of the executive order generally freezing wages. This view is supported by figures, weighted by a state agency on an antiquated basis, showing that the average weekly earnings in durable goods industries within the state are \$52.12, but is disputed by the fact that most jobs within the industry are not heavy, and are relatively unskilled. As a result of his Coast hearings, Porter has recommended to the WLB that the basic hourly wage for the California plants be raised five cents for experienced workers, and at Boeing, seven cents, the difference being explained by a higher general wage level in the Northwest and because Boeing workers have received fewer wage raises than the Californians. In impartial circles, it is considered highly fitting that Porter, generally regarded as one of the abler Federal labor negotiators, should have had the task of reconciling aircraft wage rates with those paid in the shipbuilding industry, inasmuch as he headed the stabilization meetings which set the shipyard rates long before competition among industries for workers was thought of. The WLB also will consider Porter's recommendations to set up a permanent commission to settle employer-employee differences in the far Western segment of the industry and embodying a more universal job classification system, so that like work receives like pay in the various plants. Whatever decision the WLB makes, it will topple like a house of cards wages and working conditions in the many small plants tributary to the airframe manufacturers.

Slated also for this week by the National Labor Relations Board at Portland, Ore., are hearings on the case of the Kaiser yards in that region which made the apparently grievous error of signing up with the unions too early in the game. Kaiser, who throughout his career has made it a policy to pick all his bones with the unions in the early stages of his projects, in order that full attention may be given to production later on, signed up with AFL for the Portland area yards before their personnel peak was reached, but after a substantial number had been employed as com-

pared to other enterprises in the vicinity. This course seemed fairly logical in view of the fact that the AFL is strongly predominant in the Pacific Northwest, but it failed to find favor with CIO minions, and the NLRB was called in on charges that the National Labor Relations Act had been violated. Subsequently two members of the

agencies. The Conservation Division from its San Francisco regional office has announced that one principal mill buyer on the Pacific Coast has offered to purchase up to 300,000 tons of scrap and that this should clear the scrap yards and dealers' facilities to permit shipping in for preparation of general salvage, demolition, special project and other non-recurrent scrap. It seems generally accepted that the Pacific Coast mills and foundries will require approximately 1,300,000 tons of scrap for 1943, or at the rate of over 100,000 tons but less than 110,000 tons per month. At present there is more low grade unprepared scrap than there are facilities or labor available for its preparation. In attempting to harvest and bale this "hay" a first class heated controversy has developed involving the all-too-many government agencies concerned, along with the scrap yards and the mill buyers. After two weeks of surveying and "hearing" Alex Miller was still on the Coast and still in command of the situation. His allocating and administration from Washington has been generally approved by members of the steel trade, both the yards and the mill buyers, who feel that the allocating, processing and distributing of usable and prepared steel scrap is so technical a matter with such national and even international implications that it must continue to have the benefit of experienced, conservative, technically accurate and fully advised administration.

H. J. K. OPENS NEW STEEL PLANT: Henry J. Kaiser, of shipbuilding fame, watches operations of the first blast furnace "blown in" at his new steel plant in Fontana, Calif., Dec. 30.

board were accused of bias on the basis of statements allegedly made by them while the case was being considered.

The CIO-AFL controversy, never cool on the West Coast, took a turn for the better within the War Production Board, where pressure by both bodies has won direct representation for each in lieu of the former plan of having labor matters under the jurisdiction of a neutral party.

**S**ENSITIVE to the connotations which a "scrapper" absorbs in his daily concern with "scrap," the controversy over (1) statistics, (2) preparation, (3) allocation authority, and (4) "exporting" of prepared scrap from the Pacific area has not only continued but has gained impetus, heat and implications. In company with Alex Miller, scrap chief for WPB's Steel Division from Washington, have been half a dozen others representing the respective scrap responsibilities of OPA, Metals Reserve, War Materials, Maritime Commission, Army Quartermasters, ODT, and other

### DPC Lets More Contracts

#### Washington

\* \* \* Defense Plant Corp., RFC subsidiary, has authorized the following contracts:

United Aircraft Corp., East Hartford, Conn., to provide further expansion of a plant in Connecticut at a cost in excess of \$2,300,000.

Columbia Steel Castings Co., Portland, Ore., to provide plant facilities in Oregon at a cost in excess of \$700,000.

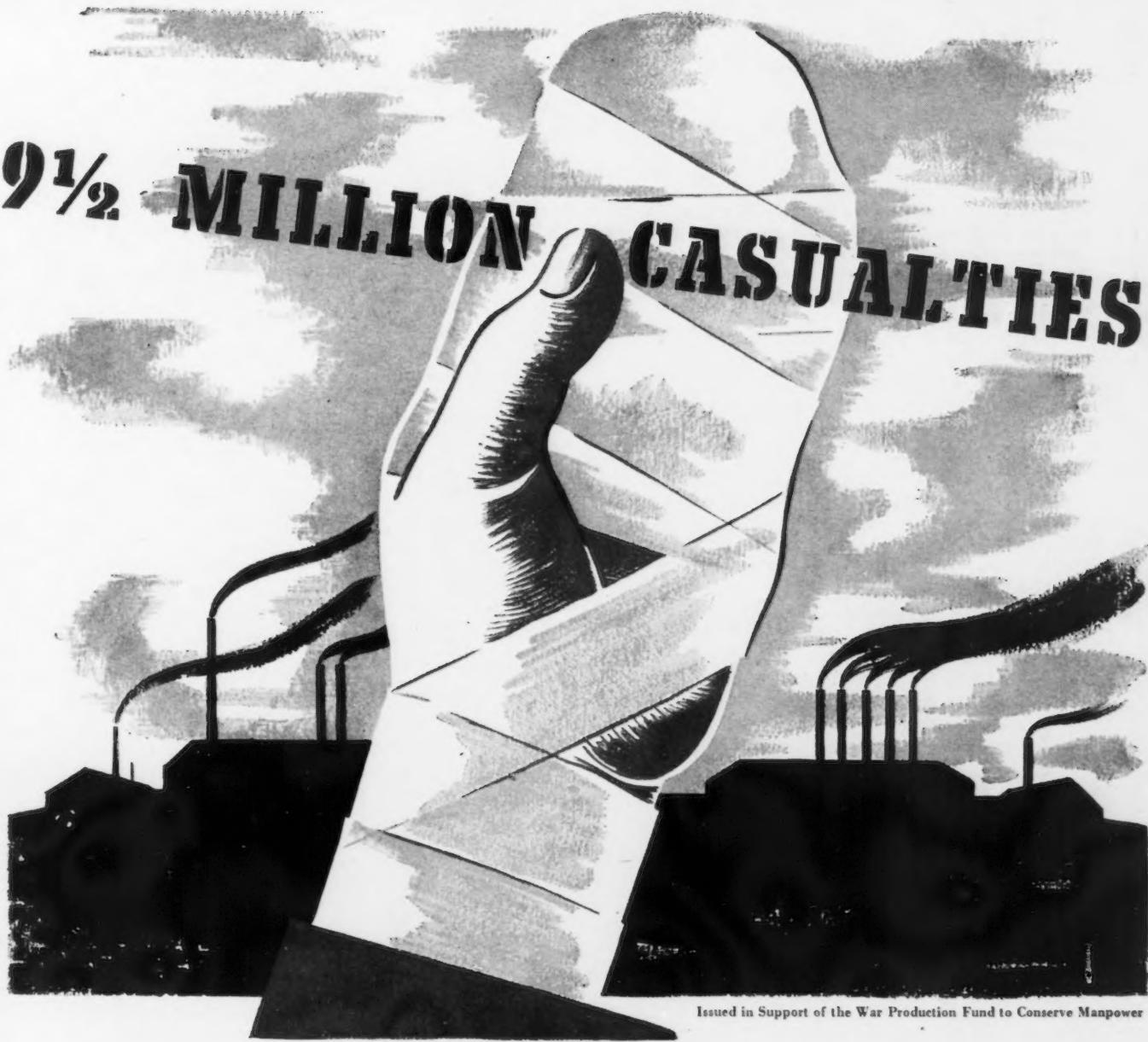
Westinghouse Electric & Mfg. Co., East Pittsburgh, to provide plant facilities in Pennsylvania at a cost in excess of \$600,000.

North American Aviation, Inc., Dallas, Texas, to provide additional plant facilities in Texas at a cost in excess of \$1,250,000, making a total commitment of more than \$34,000,000.

J. I. Case Co., Racine, Wis., to provide for the installation of equipment and conversion of plants in Wisconsin, Illinois and Iowa at a cost in excess of \$2,500,000.

Douglas Aircraft Co., Inc., Santa Monica, Cal., to provide additional facilities at a plant in California at a cost in excess of \$300,000, making a total commitment of more than \$2,000,000.

# **9½ MILLION CASUALTIES**



Issued in Support of the War Production Fund to Conserve Manpower

## **...on the HOME Front!**

This is the 1941 all-accident score: 102,500 Americans killed, 9,300,000 injured!

It's a crime to waste these millions of man hours when our fighters need everything we can produce. Industry *can* do its part. For example, a safety program in one metal fabricating plant slashed the accident frequency rate 80% in 5 years.

What can your plant do?

Make "good housekeeping" the No. 1 rule. Keep your plant clean; urge workmen not to leave tools on

the floor. Check these suggestions:

Do your shop men wear safety shoes? (Foot injuries predominate in every metal fabricating plant.)

Are good gloves worn to protect their hands? Is clothing close-fitting, with no dangling frills?

Do welders and others nearby wear head-shields or protective glasses? Are there exhaust ducts to carry off dangerous fumes?

Do men on cutting machines protect their eyes with goggles?

Do your presses have sweep or

basket guards? If two or more men work at a press, are the controls set in such a way that all must touch them before the press can work?

Do you install safeguards whenever a new "danger spot" is seen?

Help convert your accident-lost man-hours to war production. The American Rolling Mill Company, 131 Curtis St., Middletown, Ohio.



**THE AMERICAN ROLLING MILL COMPANY**

# Fatigue Cracks

BY A. H. DIX

## Wall Motto

• • • Lack of know-how is the father of fear. So, when the war is won and the historians list the reasons why, we hope that close-to-top billing will be given to the men responsible for the training courses the armed services are conducting. The speed with which an infinite number of courses was devised, their thoroughness, and the results they are producing, are among the war's major marvels.

This eulogy is prompted by a quotation that appears over the entrance to the submarine school at New London, Conn.:

Their want of practice will make them unskillful, and their want of skill timid.

—Thucydides

We think it could well be painted on every classroom wall, whether the subject taught be tool design, jungle fighting, basket weaving, aerial combat, or arc welding.

## The Letter Killeth

A recent issue of a certain magazine had a picture of a man who had just been "conked on the head," according to the caption. Do you suppose it would do any good to bean the caption writer on the bean?

—Deac

Tautologisms are excusable, even admirable, if they contribute clarity or emphasis. Even your favorite family journal speaks of something "fluctuating erratically," and the marriage ceremony uses the phrase "lawful wedded wife," which is a tautological double-header.

## Willing Hands

There is no lack of patriotic desire among women to do war work, but they are shy at engineering and must be enticed.—*Science News Letter*.

Now I know how I can aid the war effort in my spare time. Sounds like nice work, too.

—F. T. Turner, Osborn Mfg. Co.

## She Welds a Fine Seam

• • • Our campaign to call women welding operators *weldistes* has not caught on like wildfire. But Mohammed plugged away for years before his idea caught on, so we are not discouraged. Little clues we pick up here and there convince us that we are on the right trail. Latest is this statement made by General Motors' Eastern Aircraft Division, Linden, N. J.:

Expert co-ordination of the hands must be developed. In this respect women who sew or knit have an advantage over men . . . This is one of the reasons why 75 per cent of all welding trainees at Eastern are women.

## Aprononym

Here's an apronym for you: Herbert N. Klank of the Klank Steel Products Co., 1120 Orleans St., Baltimore.

—N.R.G.

It will do, but it would be better if Mr. Klank made bells. However, we are not complaining, as life is full of compromises, and occasionally there is a case of downright apronymic frustration, as in the case of Angelo Exodus, South Bend restaurateur, who obviously should have been a revolving door manufacturer.

## One Caress, One Kick

• • • One of the things we are proud of, is our forebearance in quoting love letters from readers. Some of them make us beam clear down to our waist, but knowing that your interest in them is tepid compared with ours, we have kept them to ourselves. Typical of the kind we mean is this one, just received from the superintendent of a large Canadian plant:

" . . . we find The Iron Age outstanding among the trade journals we receive. It is in fact the only one I am in the habit of indexing to our key men 100 per cent."

A sense of fairness also prevents us from exhibiting the orchids tossed at your favorite family journal, for, to be honest, we should also display the rare cabbages. As, for example, this one, pinned to a subscription renewal check for \$8 sent us by a Crafton, Pa., housewife:

Sorry to be late, but this darn thing is never read. I can't persuade my husband to stop his subscription. I talk and always lose.

We are telling her to give him another month, and if he doesn't change we will stop sending the copies and refund the amount still due. This was our policy even when an economy of plenty prevailed. Our attitude toward waste circulation amounts almost to an obsession, we are glad to be able to boast.

## Stopper

• • • He flies a plane held together with threads!—*Carborundum Co.*

## Quick Promotion

Maj. Gen. Levin H. Campbell, Army chief of ordnance, told THE IRON AGE in an exclusive interview.—Line 6, page 62, Dec. 31 IRON AGE.  
Lieut. Gen. Campbell told THE IRON AGE.—Line 18, same page, same issue.

## Scintillating Simile

. . . inseparable as a mermaid's knees.

—J. I. Butzner, Jan. 7 I.A., page 147

## He Found His Man

• • • A recent hiccup in the machine that addresses the envelopes in which you receive your favorite family journal resulted in one envelope showing only the right half of a stencil plate impression. It read:

Nighthart,  
o. of America,  
g Div.,  
gton, Pa.

Yet the post office delivered it, thereby earning this epistolary bouquet:

I think you will agree with me that our post office employees must be pretty good when they can find the person to whom this was supposed to be addressed.

The writer is G. E. Nighthart, Aluminum Co. of America, Engineering Div., New Kensington, Pa.

The postal people are not only highly cooperative but are blessed as well with a love for their work. It would have been very easy for the railway mail clerk to have grabbed the "INSUFFICIENT ADDRESS" rubber stamp and returned the copy to us. But no; he mentally ticked off the . . . gtons in Pennsylvania—Burlington, Clarington, Darlington, Flemington, New Kensington, Washington—and then by some process unknown to us he figured out which one housed a company whose name ended in "of America." Or maybe he said, "That must be my old schoolmate, G. E. Nighthart. I heard he went with the Aluminum outfit." So into the New Kensington sack the copy was dropped. Of course, after reaching the New Kensington post office the detective work was simple, as the company with the name ending "of America" is to New Kensington as the gold repository is to Fort Knox, Kentucky.

## Puzzles

In last week's petal problem R/L equals 1.025 and L/R equals 0.976.

If you can do this one in your head in 45 seconds you are underpaid. S. H. Marshall, of the Dominion Tack & Nail Co., Ltd., Galt, Ont., sent it in:

Assume that the new Alcan highway is completed and that the trip from the U. S. to Alaska takes 7 days. Each day a motor convoy starts north, and each day one starts south. How many southbound convoys will a northbound convoy meet in one full trip?

# Northern SUPER-CRANES

SERVE A WIDE RANGE OF  
METAL and WAR INDUSTRIES

MATERIALS HANDLING IS ONE  
JOB YOU CAN'T SUBCONTRACT



Northern Crane handles all material  
in the storage yard of this steel mill.



Northern Crane handling a variety  
of materials in steel mill storage.



Northern Crane in a Steel Warehouse.

Northern Cranes are working 24 hours a day—7 days a week in  
hundreds of plants—with no repairs and no shutdowns.

War service is extremely severe, and the pace permits no time for  
“coddling” a crane. They have to take it—Northern Super-Cranes do.

Materials Handling is one job you can't subcontract. If any other  
machine breaks down, you can subcontract its work. But a crane  
breakdown ties up the shop. Crane reliability is absolutely essential.

## NORTHERN ENGINEERING WORKS

General Office: 2613 Atwater St., DETROIT, MICH.

NORTHERN CRANE & HOIST WORKS, Limited • WINDSOR, CANADA

Offices at—913 South 38th St., BIRMINGHAM • 53 West Jackson Blvd.,  
CHICAGO • 2428 Spring Grove, CINCINNATI • 5724 Navigation Blvd.,  
HOUSTON • 44 Whitehall St., NEW YORK • 555 Union Trust Bldg., PITTS-  
BURGH • 4135 Gratiot Ave., ST. LOUIS • 1679 University Ave., ST. PAUL

# Dear Editor:

## DOUBLE OR NOTHING

Sir:

Your editorial of December 31, "Double or Nothing in 1943" surely is appropriate for the times, as well as forceful, so much that being 100 per cent engaged in the manufacturing of war materials, we are interested in distributing to each one of our employees, approximately 1450, a copy of your editorial.

E. C. COOLIDGE,  
President

Crowe Name Plate & Mfg. Co.,  
3701 Ravenswood Ave.,  
Chicago

## PICKLE POLISHED STAINLESS STEEL

Sir:

Some months ago an article was published in THE IRON AGE which covered anodic polishing of stainless steel. Will you let me know in what issue this appeared?

EMIL LANGBEIN  
Wm. Langbein & Bros.,  
159 Willoughby St.,  
Brooklyn, N. Y.

• See the issues of Jan. 11, 1940,  
Dec. 21, 1939 and Apr. 11, 1940.—Ed.

## KIRKSITE DIE MATERIAL

Sir:

Your booklet "Making Aircraft Sheet Metal Parts" refers to Kirk-site "A" die material. Please give us the name and address of the supplier.

S. DEBAER  
Ace Machine & Mold Co.,  
Garfield, N. J.

• Morris P. Kirk & Sons, Inc., Los Angeles, Calif.—Ed.

## BLACKENING PROCESS

Sir:

I am surprised at you, and disappointed. In your December 31 "Dear Editor" page there is an inquiry for concerns offering a blackening process. You list three, but did not mention that E. F. Houghton & Co. makes one of the best blackening salts on the market.

D. C. MINER,  
Mgr., Advertising Dept.  
E. F. Houghton & Co.,  
Philadelphia, Pa.

• Our apologies, Mr. Miner, for the oversight.—Ed.

## CREAM OF EDITORIAL CROP

Sir:

Enclosed is 25c. in stamps for which please send me one copy of the new booklet of editorials by John H. Van Deventer, which "contains the cream of the 1942 crop."

S. T. BLAIR,  
Supt.  
Anaconda Copper Mining Co.,  
Anaconda, Montana

## OUR LOSS, ARMY'S GAIN

Sir:

Better cancel my subscription, as I am now a CPT, and, as you may know, we CPT's aren't paid, so we have to watch the nickels and dimes and can only gaze in awe at \$8.

Now please don't feel badly about this. You mustn't get the idea that my favorite family journal has failed to find a place in my heart, after more than a year of opportunity. It has, in a big way. In fact I am one of its staunchest defenders and am an official salesman of abounding enthusiasm. Sincerely, I have found THE IRON AGE to stand head and shoulders above other trade journals I have subscribed to, for general get-up-and-go, specific information, broad coverage, and readability. Van Deventer is in a class by himself. A man who can think as clearly as he does deserves the admiration of big men in industry—which he has. His editorials are read and quoted by some pretty big shots in at least one big company, I know; General Electric.

When this is over, or when we draw pay, expect my request for a renewal. Even though I am not a machine shop man, I will want THE IRON AGE—it's as big as industry, and that's America.

MERLE B. MCKAIG  
Link Instrument Course, CPT.  
La Grand, Oregon

## SINGING WORKERS

Sir:

Maybe I have a BIG IDEA, but my song, "Here Comes America," seems to be taking hold of the people's imagination everywhere. I do not know whether you can get WSNJ, 1240 on the dial, Bridgeton, N. J., or not, but Vineland has taken hold on the song and used it for their war pageant....

My many friends everywhere have shown such a big interest in it that I have made arrangements for ANYBODY in the industry, defense plants, and war plants of every kind, to use it. These song copies MUST BE GIVEN AWAY and not sold because the publisher has agreed to make a price schedule approximately the same as the music dealers. Prices range from 18c. a copy in thousand lots down to 15c. a copy in lots of 21,000 or more.

I believe this song, if spread among defense plants, will tend to greatly increase the worker's morale. A singing worker is a happy worker, and everybody singing "Here Comes America" will certainly tend to unite America like a team rooting for its football team, this time for humanity.

I made a pledge with myself that

any royalty I get goes to buy defense bonds for more guns and tanks to beat Hitler and his gangsters. I was in the Air Service in the last war, and my oldest daughter has been selected as one of the WAACS, so I assure you my idea is a patriotic one.

WALLACE G. IMHOFF,  
President  
Wallace G. Imhoff Co.,  
Vineland, N. J.

## H.S.S. TOOL TIP BRAZING

Sir:

In your issue of November 19, page 55, is an article, "Two Methods of Brazing High Speed Steel Tips." Could we secure about five copies for distribution among our various departments in our Lansing plants?

J. R. FINCH  
Motor Wheel Corp.,  
Lansing, Mich.

## OVERLAPPING ARTICLES

Sir:

Will you please send me tear sheets of an article in your Sept. 24 issue, either "How to Figure Arc Welding Speeds" or "Removing Broken Drills With Arc Welding Technique." Either article would do, not both, as they overlap in the arrangement of the paper.

We wish to preserve both and file separately. This, I may say, is about the only weak point in THE IRON AGE —this occasional overlapping of articles of permanent value.

CHESTER B. HAMILTON, JR.,  
President  
Hamilton Gear and Machine Co.,  
Toronto

• We are proud of ourselves for having done away with annoying carryovers of feature articles, that is, continuations in the back of the book. But, at the moment, we do not see how we can avoid the first page of one article backing up the last page of another. Mr. Hamilton's suggestion, however, is going into our "aims for the future" editorial folder.—Ed.

## CUTTING TOOL POLISHING

Sir:

Sometime ago I understand you published an article on the subject of improving tool and cutter life through the use of high polishing and honing of cutting edges.

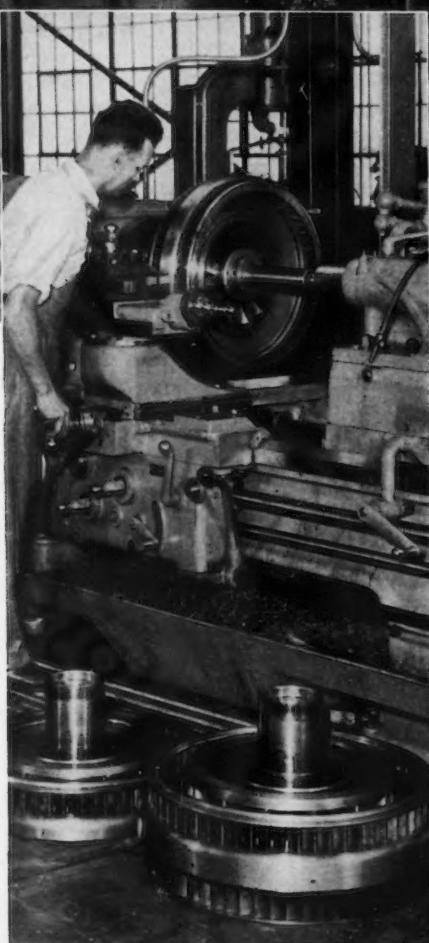
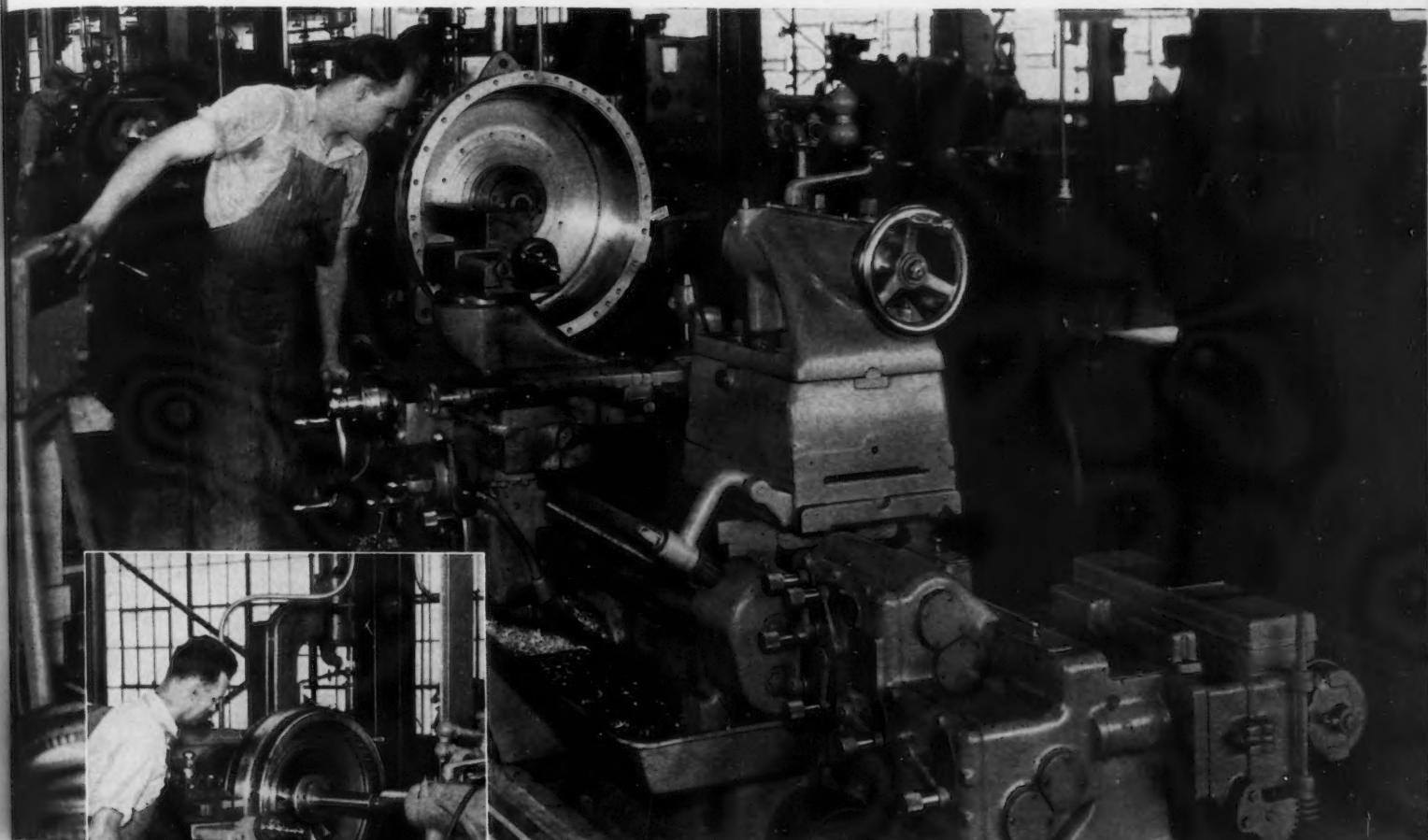
We have searched through all the old issues of THE IRON AGE, but have not been able to find it.

C. A. AKESON,  
Methods Dept.  
Oldsmobile,  
Lansing, Mich.

• The article appeared in the July 23, 1942, issue under the title, "Fine Tool Finish Increases Tool Life 2000 Per Cent." The demand for it quickly exhausted our supply and it is now a chapter in the 56-page reprint booklet, "How to Increase Cutting Tool Life," price 35c.—Ed.

# Careful job analysis saves time, material and money...

## *Keeps production on schedule*



This plant, converted to war work, had a new job to do—building fluid drives.

The large diameters of aluminum main housings and rotors suggested 36" lathes, with Monarch-Keller controls for finishing the contour surfaces. Careful job analysis showed the duty requirements could readily be met by a much smaller lathe, if raised to provide 36½" swing. Because of the lightness of the work, small size controls were deemed adequate.

Monarch 22" Model M Lathes were ordered and put to work months before the larger lathes could have been shipped. Their lighter weight saved precious critical materials. Many million machine gun bullets can be bought with the \$58,000 saved in first cost. Best of all, production is being kept on schedule.

Such applications of shop knowledge are the everyday work of Monarch field engineers. If they can help you in your War effort, they are at your service.

THE MONARCH MACHINE TOOL COMPANY...SIDNEY·OHIO

**MONARCH**  **LATHES**

COVER THE TURNING FIELD

Large photograph shows the use of Monarch lathe with automatic Keller control, permitting greatly increased production of this aluminum housing. Inset illustrates turning of rotors, with manual control.

# This Industrial Week .

- **Claimant Agencies Asking Huge Quotas**
- **Requirements Likely to Be Cut Back**
- **Mill Output and Shipments May Be Fixed**
- **FDR May Forestall Super War Board Idea**
- **Ingot Rate Up One Point to 99.5 Per Cent**

AS the conversion period for the Controlled Materials Plan proceeds, metal users are beginning to scramble toward favorable positions at the barrier for scarce materials.

Some firms, confused over the status of certain contracts following intimations of war production cuts, are requesting additional materials in order to finish their original quotas.

At the same time, according to recent tabulations, several of the leading claimant agencies under the Controlled Materials Plan are requesting such large amounts of steel for the second quarter that the Requirements Committee will have to make sharp reductions in quotas in order to balance vital demands with available supplies. Army and Navy requests alone are reported to be considerably higher than expected. Claims for cold finished steel bars, for example, are far above available production capacity. Adding tension to the picture is the scheduled increase in Lend-Lease shipments of manufactured items.

The 13 claimant agencies under CMP are putting on pressure at Washington for recognition of requirements and eventually a great deal of arguing can be expected. Furthermore, sub-surface rows at WPB threaten to break forth in renewed vigor. One faction evidently is trying to mold CMP along the old lines of PRP. Meanwhile, the Army and Navy appear to have regained considerable authority in connection with the issuing of priority ratings.

Some claimant agencies have begun the task of building up steel requirements for the second quarter on the basis that allotment numbers which are granted orders in the second quarter will take precedence over priority business and will constitute highest priority.

## News Highlights in This Issue

War Engineers in Session .....	63
Recent Washington Shifts .....	63
Dispute Between Bar Mills .....	64
Sub-surface Rows at WPB .....	65
New Warehouse Prices .....	76
CMP Class B list in Full .....	78
Price News of Week .....	82
Ingot Production for 1942 .....	89
Manpower Developments .....	90
The CMP Is a "Must" .....	92
CMP Regulation No. I .....	94
New Forms for Use Under CMP .....	95
Week's Priority News .....	96
Personals .....	98
Machine Tools .....	99
Nonferrous .....	100
Scrap News .....	102

WITHOUT going into the essential details, Admiral E. S. Land asserted last week that shipyards could build 20,000,000 tons of merchant ships in 1943 "if given enough steel." According to plans last week, the Maritime Commission will be given steel plates needed for the 1943 goal of 18,000,000 tons of merchant ships and it may be that plates for additional ships will be available.

Plate production is scheduled to move up rapidly in the next six months. Existing facilities may be able to push monthly plate output up to 1,200,000 net tons before the middle of the year when impetus will come from new units. If plate production is raised substantially before the new capacity is brought into operation, it will mean further curtailment of sheet production, already behind demand.

In an effort aimed at somehow obtaining more steel, war leaders are considering even tighter control over shipments and production. The "mix of products" made by individual plants would be curtailed and delivery territories would be fenced, according to the plans being mulled over at Washington. It is claimed transportation facilities would benefit.

Recently, WPB Steel Division men have been visiting various steel companies to see for themselves what kind of production pattern the mill is capable of. They have obtained and are obtaining data showing the variations between ingot production and finishing capacity, limitations at soaking pits, blooming mills, etc. It is expected these visits will enable the WPB men to be in an excellent position to help out when production quotas are set each month. Short cut methods, in clarifying the distribution problem, may also result from these visits.

A MOVE can be expected by the Administration at Washington to forestall congressional bills which would set up a super war production authority. It may be that the various heads of war agencies will be ordered to assemble in regularly-timed sessions with the President acting as referee.

New recognition has come for the important role played by steel warehouses, which are permitted to take considerable steel between now and March if they can get it. Another interesting development is the action by H. G. Batcheller, director of the WPB Steel Division, concentrating a large part of the now limited production of concrete reinforcing bars in steel rail rerolling mills. These mills produce steel bars from old railroad rails and compete with billet reinforcing bar makers. A controversy has been raging between the two types of mills. Even though Batcheller's directives seem to have closed the door on billet steel makers, repercussions are apt to arise. Some billet mills have on hand large amounts of top cuts from shell

steel heats which they wanted to roll into reinforcing bars.

The first week of the new year saw the steel industry in no particularly changed position either from an operating or supply standpoint. New business was still expanding at several of the major production centers, but in the Chicago area the trend of new order volume was reported downward, in most cases reflecting adjustments to meet PRP and CMP situations. The alloy steel supply situation continues acute everywhere.

To some observers, any easing of the steel situation through inauguration of CMP seems improbable. Elsewhere it is felt that CMP is becoming more cumbersome and falling into some of the same pitfalls that hurt the effectiveness of the Priority System and PRP.

**T**HE scrap supply situation if anything is a little tighter except on the West Coast. One mill buyer on the Pacific Coast has offered to buy 300,000 tons of scrap, which would help clear the scrap yards to permit the shipping in of general salvage, demolition material and other types of scrap.

Without fanfare, one large auto company has gone into the production of cargo plane engines in addition to its output of bomber type motors. The two types are somewhat similar but there are 316 parts in the cargo plane motor which are not manufactured for the bomber type engine and relocation of several important components is necessary. The same auto company has started operations in one of the largest aluminum forging plants in the nation, in addition to several other similar plants which it has been operating.

An attempt to reduce war plant absenteeism in Michigan, Ohio and Kentucky will be made in a plan soon to be launched by the War Manpower Commission. An absenteeism check list will be made available to assist employer and worker groups in analyzing the problems and to encourage plant labor-management committees to approach the problem.

In the first decision of its kind in the Cleveland area, the Regional War Labor Board office has ruled an escalator clause in the contract between Diamond

## 1942 Production Figures Show

### "Arsenal of World Is Making Good"

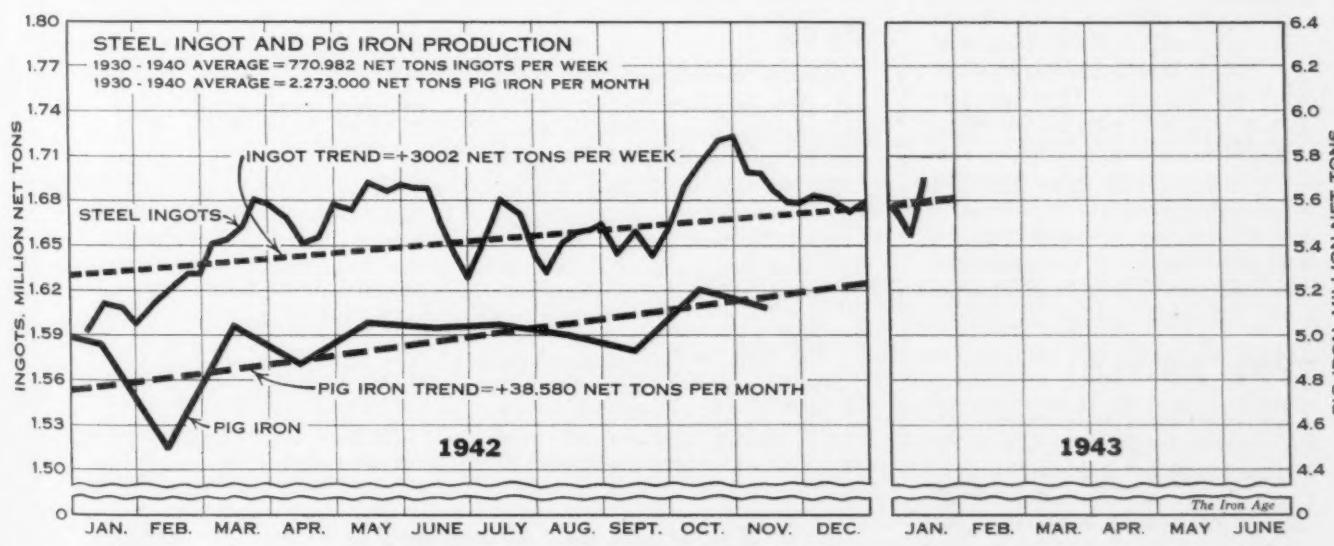
• • • With "genuine pride" President Roosevelt gave 1942 war production figures to Congress last week. We produced about 48,000 planes in 1942, he said, and in December turned out 5500 military planes at a rising rate. Other 1942 production figures cited by the President included: 56,000 combat vehicles; 670,000 machine guns; 21,000 anti-tank guns; ten and a quarter billion rounds of small arms ammunition; 181 million rounds of artillery ammunition; 8,090,000 tons of merchant ships.

Statistics from other sources last week showed that in 1942 steel ingot production was 86,092,209 net tons; steel plate shipments were 11,809,938 net tons (strip mills produced 5,194,022 tons of plates); shipments by U. S. Steel Corp. totaled 21,064,157 net tons.

Alkali Co. of Painesville, Ohio, and its employees was inoperative because it raised workers' average straight time hourly rates more than 15 per cent above rates on Jan. 1, 1941.

**S**TEEL ingot rates in the United States this week climbed one point to 99.5 per cent of rated capacity from last week's revised figure of 98.5 per cent. Pittsburgh ingot output gained one point to 101 per cent from the corrected rate of 100 per cent last week. Operations in the Chicago area have increased by one and a half points to 101.5 per cent.

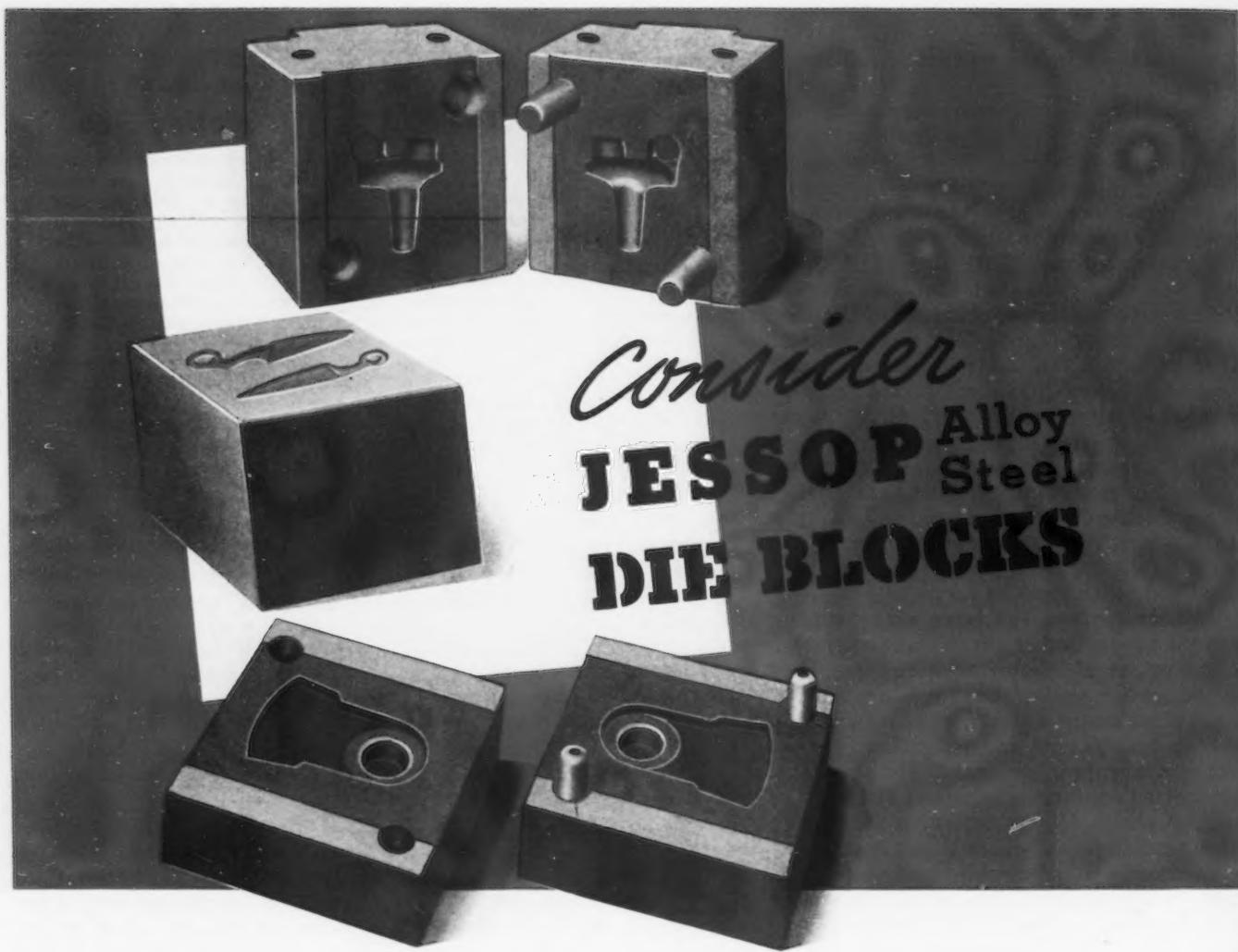
Rising a point above last week's schedules was Philadelphia output, at 92 per cent this week, and Cleveland at 95 per cent. Wheeling steelmaking jumped four points from 86 per cent last week to 90 per cent. Production in Detroit has increased two and a half points to 106 per cent while in Cincinnati the ingot rate has shot up 10 points to 109 per cent. Youngstown, Buffalo and St. Louis continue melting steel at the same rate as last week, namely: 101, 104.5 and 106.5 per cent respectively. Only district showing a decline in ingot production is the small Eastern area where operations have fallen off five points to 100 per cent.



Steel Ingot Production by Districts Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	S. Ohio River	West	St. Louis	East	Aggregate
January 7	100.0*	100.0	101.0	91.0	94.0	104.5	86.0	98.5	103.5*	99.0	102.0	106.5*	105.0	98.5*
January 14	101.0	101.5	101.0	92.0	95.0	104.5	86.0	98.5	106.0	109.0	102.0	106.5	100.0	99.5

\* Revised



## For Hot Work Applications



Let a Jessop Service Engineer explain the advantages of using JESSOP Alloy Steel

Die Blocks for various hot work applications. They are furnished in fully annealed condition to facilitate ease of machining and for subsequent hardening. Each die block is tested to assure thoroughness of annealing, and also carefully inspected for size and workmanship before shipment. They are available in the following types:

### TYPE 2B-(LC)

Tungsten Hot Work Die Steels—with low carbon content—for tools subject to heavy battering action where hardness and considerable toughness are required. APPLICATIONS: Brass Forming Dies, Extrusion Dies, Gripper Dies, Heading Dies for Bolts and Rivets, Hydraulic Forging Dies, Plungers, Trimming and Swaging Dies, Upsetting

Dies, also for die casting of aluminum and copper alloys.

### TYPE J

Chrome-Molybdenum hot working steels with low carbon content and having extreme toughness and hardness. For dies where lower initial cost is of importance. APPLICATIONS: Drop Forging Dies, Gripper Dies and Open Dies, Mandrels and Rivet Sets, Punches and Plungers.

### TYPE JJ

Same as TYPE J with higher carbon content. Recommended for use when wearing qualities are most important and where slight sacrifice

of toughness is permissible. Superior to regular straight chromium Hot Work Steels. APPLICATIONS: Bull Dies, Hot Bending Dies, and also same applications as TYPE J.

### TYPE DICA-B

Developed especially for die casting of aluminum and aluminum base alloys. It is highly resistant to abrasion and corrosive action. Can be air hardened without excessive scaling. APPLICATIONS: for die casting of Aluminum and Aluminum Base Alloys, it is also used for Drop Forging Dies, Header and Gripper Dies, Hot Press Dies.

**JESSOP STEEL COMPANY**  
Washington, Pennsylvania

**Jessop Steels**

CARBON · HIGH SPEED · SPECIAL ALLOY  
STAINLESS · COMPOSITE STEELS



# Improvements in War Equipment Outlined to Engineers at Detroit

• • • Glimpses of the recent achievements by engineers of the United States who are making war equipment better, were among the highlights of the SAE War Engineering Production Meeting which opened in Detroit this week.

Many of the developments hold promise of being important in the post-war period.

Describing the use of substitute materials, John G. Wood and R. F. Sanders of Chevrolet Motors, said that in an Army 1½-ton truck alone, 107 items made of rubber, 129 items made of copper or copper-base alloys, 57 items made of tin and tin-base alloys, and 60 items made of nickel and chromium alloys have been replaced with substitutes, but without sacrificing durability or reducing the safety margin.

An almost completely new set of alloy steel compositions shortly will be used for making the majority of the working parts of aircraft engines, according to M. H. Young and H. Hanink, of Wright Aeronautical Corp., Paterson, N. J. Mr. Young said that certain new steels selected by the SAE Aircraft Materials and Processes Coordinating Subdivision from the new "National Emergency" series

of steels will aid in stretching the nation's supplies.

Use in war planes of integral power plants, separately built by aircraft-engine specialists to international standards and readily interchangeable between fuselages, was recommended to the meeting by Dr. Sanford A. Moss, of General Electric Co., West Lynn, Mass.

Dr. Moss proposed that the power plant be built to form the whole front section of a nacelle, comprise an assembly of engine, turbosupercharger, generator, propeller, and all accessories designed to give a definite overall performance, and planned so as to be attached to the standardized nacelle fire wall of any British or American plane.

Aircraft engine carburetors now function satisfactorily in practical operations and will continue to improve, but cannot be expected to meter to closer limits than 5 per cent over the engine operating range, F. J. Wiegand, of Wright Aeronautical Corp., asserted.

The story of the development of substitutes used for engine bearing alloys was told by L. M. Tichvinsky, senior mechanical engi-

## News of Industry

neer, U. S. Naval Engineering Experiment Station, Annapolis, Md., who said engines in motorized military equipment will keep running despite the shortage of tin for bearing alloys.

M. F. Garwood, of Chrysler Corp., Detroit, told how difficulty was encountered in making the forecasing for the Bofors 40-mm. gun from steel castings which were not available in quantity. Engineers developed a method of making the part from ½-in. SAE-1025 plate, blanked, formed, welded into a tube and then welded to the gun.

C. L. Eksergian, Budd Wheel Co., told how, in producing 90 mm. shells it was found possible, by opening clearances relatively a few thousandths of an inch, to increase punch life to 10,000-25,000 forgings from 50.

## Here's Chance to Catch Up on Recent Personnel Changes at Washington

Many shifts have been announced at Washington recently, including the following:

- • William K. Frank, chairman of the board of Copperweld Steel Co., Pittsburgh, appointed director of the General Industrial Equipment Division, Office of Civilian Supply, to succeed C. S. Williams.
- • Carl W. Myers, district manager of the Canton-Massillon Alloy Division of the Republic Steel Corp., appointed special assistant to H. G. Batcheller, director of the WPB's Steel Division.
- • A. B. Cozzens, Cleveland, appointed consultant to the WPB Stockpiling and Transportation Division.
- • James S. Knowlson resigned as vice-chairman of the WPB.
- • L. J. Rosenwald, director of WPB conservation division, resigned effective Feb. 1.
- • John R. Turney, resigned as director of ODT's Division of Transport Conservation.
- • Charles L. Dearing appointed director of the new Staff Division of Review and Special Studies and Harold J. Drescher named associate director.
- • Francis T. McNamara, associate professor of electrical engineering at Yale University, appointed deputy director of WPB Communications Equipment Division.
- • M. H. Hedges, research director of the International Brotherhood of Electrical Workers, appointed to WPB Planning Committee.
- • William Fitzhugh resigned as deputy director of the WPB Containers Division. Roswell C. Mower, formerly assistant director, will take his place. Russell Gowans appointed assistant director.
- • C. S. Williams appointed director of the WPB Controlled Materials Division.
- • Richard N. Johnson succeeds Roland S. Vaile as director of the Consumer Goods Division of the WPB.
- • John A. Hurley, appointed head of new Wholesale and Retail Trade Division of WPB.
- • Hugh M. Besheres appointed chief of WPB Heat Exchange Branch of General Industrial Equipment Division.
- • Lawrence A. Appley, vice-president of the Vick Chemical Corp., appointed chief of the War Manpower Commission's Placement Bureau.

## Controversy Grows Warm Over Which Mills Will Roll Bars

Pittsburgh

• • • A minor but nevertheless important battle involving concrete reinforcing bars is now going on between several billet steel makers, the rail steel rerolling mills, and the War Production Board. This controversy is the direct result of a decline in demand for concrete reinforcing bars, as well as limitation orders against the manufacture of certain products made by the rail mills during peacetimes.

Rail steel rerolling mills, which number about 11 and employ approximately 1500 people, during the period of 1937 to 1940, expended their efforts on 65 per cent of their production for merchant bars and 35 per cent on concrete reinforcing bars. During this time it is claimed that the rail mills participated to the extent of approximately 11 per cent of the total concrete reinforcing bar business, the balance going to steel companies making what is known as new billet reinforcing bars.

Billet reinforcing bar makers claim that rail mills during the 15 months from July, 1941, to September, 1942, accounted for approximately 8 per cent of the total reinforcing bar business, which at that time was running over 175,000 tons a month. It is claimed that the rail mills now want 100 per cent of the current reinforcing bar business in those sizes which are the most common and which represent the bulk of the tonnage.

The rail bar mills on the other hand claim that they need the bulk of the reinforcing bar business because the 65 per cent of their operations which had been expended on merchant bars has been eliminated due to WPB restrictions on such things as Army cots, beds, fence posts and agricultural implements.

The billet bar makers counter with a suggestion that since structural wood is now at the head of the list on group 1 (strategic materials on which demand far outstrips supplies) the conservation and substitution branch of the Conservation division, WPB, should allow the application of small rail steel shapes on such items as Army cots, etc. This, they claim, would give the rail mills more business

### WPB Acts in Behalf Of Rail Steel Bar Mills

Washington

• • • Action to preserve the manpower and facilities of steel rail rerolling mills by concentrating a large part of the now limited production of concrete reinforcing bars in these mills was announced Jan. 11 by H. G. Batcheller, director of the WPB steel division.

The action taken through production directives and special directives prohibits steel mills except those located in California, Washington and Oregon from producing concrete reinforcing bars, except sizes which rail rerolling mills do not regularly produce, or bars whose specifications cannot be met by rail steel quality.

and allow the billet steel manufacturers to apply off heat, off surface discards and excess bessemer steel billets for reinforcing bar tonnage. It is said that the tonnage available for reinforcing bars among the new billet mills approximates 70,000 tons a month, while the rerolling rail mills have available approximately 30,000 tons of rails a month.

A plan submitted by Harold J. Ruttenberg (CIO-USW), labor representative, WPB, and also a member of the committee which was formed to look after the interest of the non-integrated steel mills, which recommended that approximately 30,000 tons of concrete reinforcing bar business should be diverted to the rail mills and 5000 tons of sizes not made by the rail mills be diverted to the new billet or steel mills, has been under severe fire by the latter group.

The billet concrete bar makers, which represent for the most part the large integrated companies, claim that if this plan were put into operation more than 250 fabricators employing 7500 employees would be severely affected. The fabricators, it is claimed, have been receiving concrete bars in stock lengths for \$1.90 a 100 lb. f.o.b. basing points, which allowed them to make a reasonable profit when reselling to contractors. The fabricators claim that the rail mills will not sell them stock lengths at these prices, hence they would be forced to go out of business in many instances if they had to pay from \$2.15 to \$2.33 a 100 lb. f.o.b. and then sell at the ceiling price of \$2.40 a 100 lb.

Both sides claim that if concrete reinforcing bars were placed in group 3 of the conservation list, current troubles might disappear.

**SEVEN-MAN RAFT:** The new seven-man rubber life raft recently developed for the Army to give aviators forced down at sea greater protection and comfort, has been put through a series of tests at Bolling Field, D. C. Note the seven men and the large number of supplies which can be carried aboard the raft.

Harris & Ewing Photo



## Disputes Behind the Scenes At WPB Seen Ready to Break Out

*Washington*

• • • Sub-surface rows at WPB threaten to break forth in renewed vigor despite the fact that the organization is supposed to have been finally revamped for the last time by Ferdinand Eberstadt, WPB Program vice-chairman. One trouble spot is made up of the malcontents who still favor PRP and the old Priorities System. They are trying to mold CMP along the old lines. Their antagonists are trying to wall in such proposals so that CMP may go into effect substantially in the same shape in which it was proposed. Valiant efforts are being made by officials in WPB to sabotage CMP before it ever goes into effect.

Not a fight but a matter of disagreement is the fact that WPB Chairman Donald M. Nelson has not sharply defined and organized the office of WPB Vice-Chairman Charles E. Wilson. In view of the commitments made to him by Mr.

Nelson, it seems Mr. Wilson expects the authority to set production scheduling machinery into motion. It is reported that Mr. Wilson insists that the requirements subcommittees in the industry branches be abolished and that authority over programs delegated to Mr. Eberstadt be defined by Mr. Nelson so that it does not conflict with the scheduling powers Mr. Wilson thinks he needs.

The abolition of the requirements sub-committees within the industry division would in effect give Mr. Wilson jurisdiction over the scheduling of components. Under present procedure, Class B product requirements are transmitted to the Industry Division simultaneously when submitted to the WPB Requirements Committee. The Industry Division requirements subcommittees have the authority to review and make recommendations of these components and thus make the initial

recommendation and final determination with respect to components within the Office of the Program Vice-Chairman who is likewise chairman of the WPB Requirements Committee.

Besides, the program vice-chairman has authority over programs already delegated by Mr. Nelson which might conflict with that desired by Mr. Wilson. The word "program", not as yet exactly defined, seems to conflict with the conception of scheduling held by Mr. Wilson and his subordinates, it is alleged. This question is likely to be settled when the production dispute between WPB and the War Department is resolved by the President.

Labor sources are saying that WPB is becoming more and more over-stuffed with too many employees, and too many organizational layers. For instance, it is proposed to re-create the old WPB Raw Materials Divisions which died in the last reorganization or two. The new Division would be a layer between the industry material divisions and the Office of the Director General for Operations. It is pointed out by observers that if the policy makers of WPB are dissatisfied with the way the material divisions are operating, personnel changes would be more economical and effective than the creation of another organization layer.

**DAY NURSERY IN ACTION:** Children of women workers at the Buffalo Airplane division of the Curtiss-Wright Corp. are cared for in a special day nursery which has been established by the company. The nursery has proved to be such a valuable accommodation to these working mothers and the company that a redoubling of its capacity is planned. Here some of the mothers are shown taking their children home after a day at the plant.



### Magnesium Plant, Third Largest Producer This Year

*Austin, Texas*

• • • The new magnesium plant of International Minerals & Chemical Corp. here is the third large magnesium producing plant to enter production since Pearl Harbor. Designed and constructed by the Austin Co., Cleveland, the plant uses the Dow process and was built as a Defense Plant Corp. project.

Magnesium output at the new plant is still being expanded to meet demands for structural magnesium for aircraft production and ordnance materials, and other magnesium products needed in war materials. Several hundred engineers and more than 5000 construction workers are still at work for the Austin Co. on design and erection of additional magnesium producing facilities.



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## NEWS OF INDUSTRY

### New PD-25F Required Filed Under PRP

• • • Manufacturers operating under PRP will shortly receive copies of a new Form PD-25F. This form, used to apply for supplementary authorizations under PRP, is revised as of Dec. 15, and as soon as it is available must be used in place of the current version.

The new form differs from its

predecessor in two important respects. The first is that it may be used to apply for supplementary authorizations for advance quarters, as well as for the quarter in which it is submitted. The second difference is that requests for supplementary authorizations must be made in terms of additional requirements only and not, as in the past, in terms of revised total requirements.

### Alcoa Casting Office To Move to Pittsburgh

Cleveland

• • • Headquarters for the aluminum casting division of the Aluminum Co. of America will be moved from Cleveland to Pittsburgh shortly after the first of the year, according to Alcoa officials. This office embraces the casting operations at the five Alcoa plants at Cleveland, Bridgeport, and Fairfield, Conn., Detroit, and Los Angeles, as well as those in several government owned plants operated by the company.

Allen B. Norton, manager of the casting division and head of the plant in Cleveland, will move his office to Pittsburgh, and Harold C. Erskine, now manager of the Bridgeport-Fairfield plants, will take over the management of the Cleveland plants.

### New Yorker Appointed To OPA Court Review

Washington

• • • Walter J. Derenberg, New York, has been appointed chief of the research and opinion branch of the OPA Court Review, Research and Opinion Division. Mr. Derenberg will be in charge of the direction of legal research and the preparation of legal opinions.

**NO GALLOWS:** Looking much like a hangman's gallows, this is actually the largest portable crane ever built, according to its manufacturer, the Barrett-Cravens Co., Chicago. It has a capacity of 4000 lb. and a lifting height of 22 ft. Boom length is 10 ft.



### PROVED—AND READY FOR WARTIME NEEDS

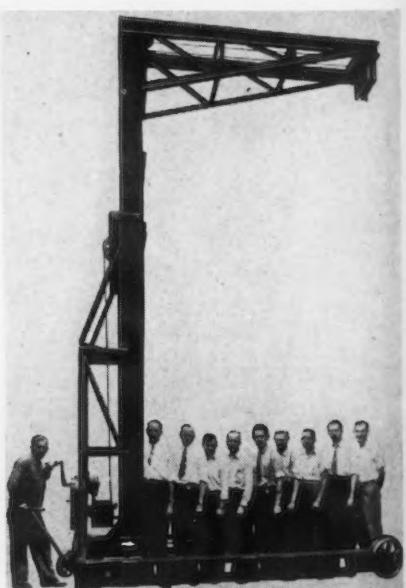
You can get up-to-the-minute efficiency for wartime needs . . . in a thoroughly proved, time-tested door that cuts the use of war-vital steel to a minimum!

You get these things in the Kinnear Wood Rolling Door. It features the same space-saving upward action — the same time-saving convenience — as the famous Kinnear Steel Rolling Door. It opens vertically and coils compactly above the doorway, where it stays out of the way and out of reach of damage until closed.

Motor operation is also available, and one or more remote control stations can be located at strategic points to further facilitate traffic control.

The Kinnear Wood Rolling Door is constructed of rugged wood slats interlapped and jointed with metal cables

or tapes—a construction that affords free action but blocks out wind and weather and stands up under heavy usage. Write for full details today! The Kinnear Manufacturing Company, 1760-80 Fields Avenue, Columbus, Ohio.





Announcing the consolidation of

**MICHIGAN ALKALI COMPANY**

**THE J. B. FORD COMPANY**

into

**WYANDOTTE CHEMICALS CORPORATION**

Back in the 1890's, two companies were established in Wyandotte, Michigan, by Captain John B. Ford, father of the plate glass industry in America, and an outstanding pioneer in the chemical industry.

The Michigan Alkali Company grew to be one of the great basic chemical companies of the world, manufacturing a wide range of products serving more than fifty different industries.

The J. B. Ford Company developed into the world's largest manufacturer of specialized cleaning materials, and an important factor in promoting sanitation and safeguarding the health of America.

The company controls warehouse facilities strategically located at approximately 200 points throughout the country.

#### **Consolidation a Logical Step**

On January 1, 1943, these companies were consolidated, still under the

same family ownership, to form the Wyandotte Chemicals Corporation.

This consolidation is a logical recognition of the close relationship which has existed between the companies for many years.

Management and personnel will remain the same, but the consolidation will offer an opportunity for even greater service to our customers.

#### **Many Benefits to Customers**

Wyandotte Chemicals Corporation will continue to have one of the best distribution systems in the United States—making all Wyandotte products more readily available, to smaller as well as larger consumers.

Combining the technical staffs of the two companies will now make it possible to bring a wider range of expert technical service to Michigan Alkali and The J. B. Ford customers everywhere.

The enlarged research laboratories may be counted upon to develop

important new products to meet the needs of war and post-war conditions.

And by the complete integration of the ownership of raw material sources and control of manufacturing and distribution *in the one company*, Wyandotte Chemicals Corporation will be able still further to enhance the *quality and value* for which Wyandotte products have long been noted.

Contracts and commitments of Michigan Alkali Company and The J. B. Ford Company in force at the end of the year 1942 will be carried out without interruption by the Wyandotte Chemicals Corporation, and customer contacts will be maintained without interruption by the Michigan Alkali Division and the J. B. Ford Division of the consolidated sales departments.

It is our sincere intention to continue to develop and manufacture to the best of our ability products which help the nation in wartime and which will contribute to a fuller life when peace is won.

#### **WYANDOTTE CHEMICALS CORPORATION**

**Michigan Alkali and J. B. Ford Divisions**

**Wyandotte, Michigan**

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NEWS OF INDUSTRY

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**Factory Building Costs  
Up 2.7 Per Cent During 1942**  
*Cleveland*

• • • Factory building costs advanced 2.7 per cent in 1942, according to the index computed quarterly since 1913 by the Austin Co., currently engaged in design and erection of more than 60 war plants. At present, the index stands at 115 as against 112 at the end of 1941 and a peak of 135 reached during the

last year. This limited construction cost increase, in the face of a 60 to 65 per cent advance in building activity, indicates the effectiveness of government stabilization of basic cost factors, George A. Bryant, president of Austin, stated.

Mr. Bryant said the volume of domestic construction for war industries or continental defenses in 1943 will not equal that of 1942, assuming American war production facilities remain intact.



**WPB AWARD WINNER:** A simple suggestion that doubled the life of large Roto-Mill cutters won for Ben F. Cain, tool inspector of the Caterpillar Tractor Co., a WPB gold award for a war production suggestion of exceptional merit. Mr. Cain's suggestion was to reduce the diameter of three spacers on a Roto-Mill cutter setup, shown in the photograph, so that the cutters may be recut two additional times. This idea, which was put into practice, doubles the working life of the cutters.

*Ask*

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**WPB Corrects Advisory Committee Announcements**

• • • The WPB director of industry advisory committees has announced the following corrections in the committee membership:

Tool steel industry advisory committee: Howard M. Givens, Jr., manager tool steel sales, Allegheny Ludlum Steel Co., Pittsburgh, in place of Mr. Gibbons of the same company.

Rails and accessories industry advisory committee: H. B. Scott, assistant vice president, Wheeling Steel Corp., Wheeling, in place of H. D. Scott of the same company.

**Omitted from E Award List**

• • • The Name of Wyckoff Drawn Steel Co. was inadvertently left out of the list of Army-Navy E awards in last week's issue. This company has been awarded the Army-Navy E with added star, having previously been awarded the Bureau of Ordnance Flag with Navy E and the All Navy E burgee.

# Gets into tight spots!



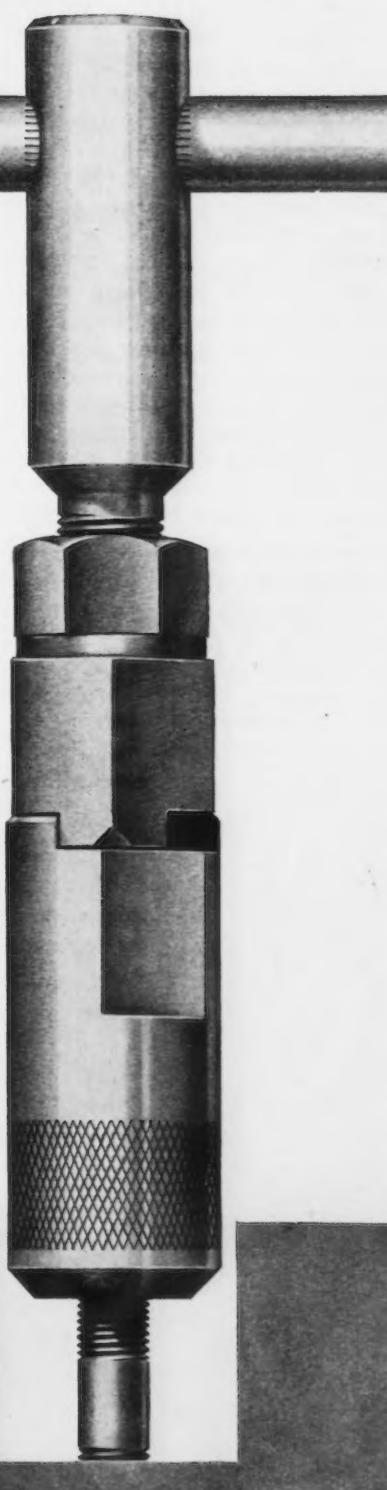
LOOK at that O.D., and you'll know why Apex stud setters get into hard-to-reach places with such ease and precision—even in the hands of semi-skilled workers. These simple, trim, clean-cut stud setters have small body diameters for their capacities. They are extremely easy to adjust for length of thread on stud and maintain proper adjustment in service. Simple

design plus ample ruggedness and toughness make them fine tools for either hand or power applications. Four different sizes will set studs up to  $1\frac{1}{4}$ ". You can get them with Morse taper, hexagon, T-handle and male or female square drive shanks, or combination T-handle with female square for use with a torque wrench. Write for Bulletin No. 101 for all the facts.

# APEX

THE APEX MACHINE & TOOL CO., DAYTON, OHIO

Manufacturers of friction tapping chucks, quick change and positive drive drill chucks, vertical float tapping chucks, parallel floating tool holders, power bits for Phillips, slotted head and Clutch Head screws, hand tools for Phillips and Clutch Head screws, aircraft universal joints, plain and universal joint socket wrenches.



## Strikes over Petty Causes Cut Seriously into Plant Output

Cleveland

• • • There is more than a slight chance that Eddie Rickenbacker is right in his statement that if men on the fighting front could change places with men on the production front, output of war materials would rise quickly.

The workingman, with more money to spend, often feels like taking time off to spend it. This is a tendency that Government, management and unions have tried unsuccessfully to stifle. Furthermore, industrial accidents have increased, adding to lost production.

In spite of all these natural tendencies, however, there is one factor that is limiting plant production that can be coped with. This factor is strikes. No matter how short-lived, they cut seriously into plant production schedules, and often are felt long after the plant is back in operation.

Whether the strikes are labeled "authorized" or "wildcat," their effects are the same, and in spite of guarantees of no strikes in many union-management contracts, they still occur in alarming numbers.

For the most part, strikes during the past six months have been the result of minor grievances that have been called to the attention of management. The walkouts start before adjustments can be made or arbitration arranged. Frequently, unions lay all blame for the work stoppages to the men themselves, classing the disturbances as "wildcat" strikes. Actually, in many cases the strikes are called to bring matters to a head.

For example, the two-day strike at the 98-in. strip mill of Republic Steel Corp. late in December was termed a "wildcat" strike and also a "lockout" by the union. As to

it being a wildcat strike, that is completely out of the question since it was union-sponsored in spite of the "no strike" clause in the union contract. As to the lockout phase, this came about because the union claimed time cards were not in place for the men reporting to work. Actually, time cards were in place for men on a new schedule arrangement, but according to the company the men who had worked the shift under the old schedule reported for work and consequently no time cards were in place for them.

It is obvious that the strike is the one medium by which the union can force a hearing by the War Labor Board.

Also, the pettiness of some of the grievances that have come up for discussion through union channels has caused considerable trouble and production delay.

Such pettiness can be shown in the case of a Warren, Ohio, firm, employing about 1000 men, during the registration for gasoline rations. This firm set up an elaborate mechanism to facilitate registration of employees. The men were registered quickly and accurately and then, after the registrations were taken by the company to the rationing board, the employees were handed their ration books.

However, the shop union grievance committee presented to the company a request for overtime in periods ranging up to but not more than three minutes for the men in the plant that had stood in line. This question was wrangled over better than half a morning before an agreement was reached.

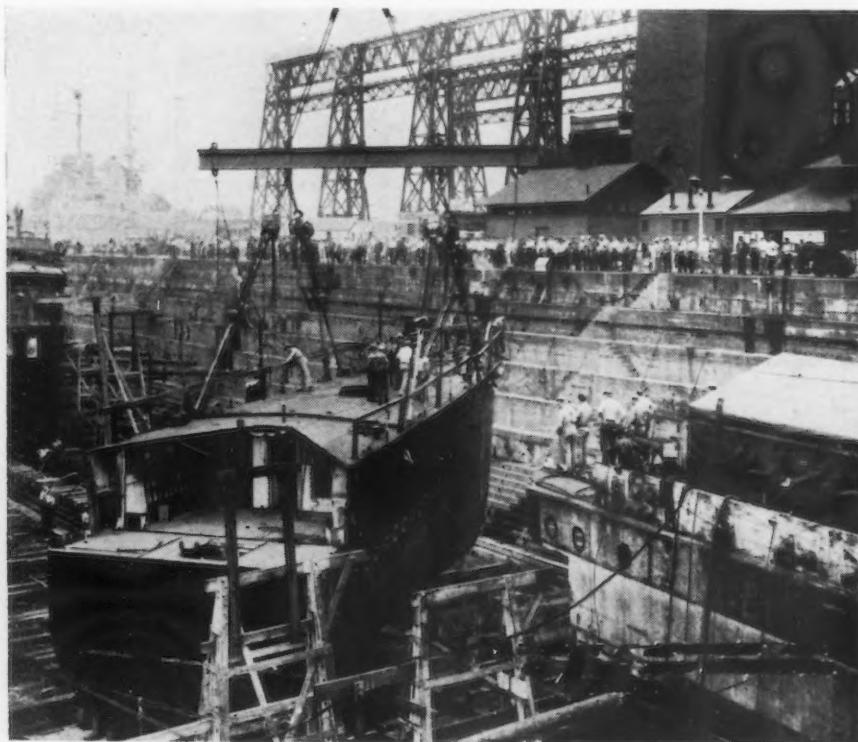
Likewise, another incident of pettiness was the refusal of some 15 machinists to check out after working a shift because they had to get in line to pass the time clock, and the line didn't move fast enough to suit them.

There have been 14 strikes at one large war production plant in the Cleveland area since Pearl Harbor, lasting anywhere from one shift to five days, and in almost every case the men went back to work only after the WLB refused to hear their case.

Since the freezing of wages, the heat has been taken off by the union for pay increases, but to emphasize union worth to members it has been necessary to turn to shop grievances.

**GIVES UP BOW:** A scene in the Navy Yard at Philadelphia as the bow of the decommissioned destroyer Taylor was lifted and turned after being cut away for grafting to the Taylor's identical sister, the old four-stack U.S.S. Blakeley, barely seen at the left. The Blakeley lost her bow during action in the Caribbean Sea when she was struck by an Axis torpedo. Today the Blakeley is back at sea seeking revenge and is claimed to be better than ever.

Official U. S. Navy Photograph International News Photos



## NEWS OF INDUSTRY

### Be Diplomatic to Diplomats, Is Theory

Harrisburg, Pa.

• • • It takes a diplomat to handle a diplomat. At least, that was apparently the theory of U. S. Department of Justice representatives when they called upon the Harrisburg office of the U. S. Employment Service recently to supply 30 guards for employment at Hershey, Pa., where Vichy French Diplomats are interned.

The order specified that applicants should know how to deal with people in a "diplomatic" way.

### Inland Plant Breaks 51 Records During '42

Chicago

• • • Despite the loss of hundreds of workers to the armed services and a lack of an adequate supply of suitable scrap, Inland Steel Co. during 1942 maintained production for the war program at well above rated capacity. Operations for the first 11 months of the year averaged 102.2 per cent, against an industry average of 97.1 per cent.

Fifty-one production records were established at the Indiana Harbor plant in 1942. Inland more than tripled its monthly output of plates; set a new high ingot production during March with 304,676 tons, and a record in blast furnace production with 152,385 net tons in May. The ore carrier "L. E. Block" established a new mileage record for lake freighters in a single season with 61,887 miles traveled in 38 trips.

The year's feats came in the face of a 33 1/3 per cent turnover in labor at Indiana Harbor, and a 40 to 50 per cent replacement of personnel in the company's general offices. Women are now prominently in the production picture.

### New Production Marks Are Set by Republic Steel Corp.

Cleveland

• • • Operating at 99.5 per cent for 1942, Republic Steel Corp. established new production highs in every major category of steel operations, according to figures released by company officials.

Steel ingot production hit 8,595,

000 tons to beat the record of 1941 by 479,000 tons. Eleven out of the corporation's twelve ingot producing departments established new records.

Pig iron production for 1942 reached 5,316,000 tons for an all-time record. Six of the corporation's nine coke departments broke records. Total output was 4,739,000 tons.

Electric furnace ingot production totaled 916,000 tons for the year. This established a new high of 57 per cent more tonnage than in 1941, which more than doubled the output of any previous year.

### Weirton Sets Record

• • • An all-time high in monthly and yearly production records was announced recently by the Weirton Steel Co. joint labor-management committee. Shattering all previous records established in the history of the company, the new production figures were disclosed to the joint committee by T. E. Millsop, president of the company.

Production of open hearth steel

ingots in December from twelve stationary open hearth furnaces exceeded by 3,006 net tons the highest previous monthly record which was established last March. Production of steel ingots for the year 1942 was 8.6 per cent higher than for any previous year in the company's history. The amount of finished steel produced in 1942 also was 8 per cent greater than in any previous year.

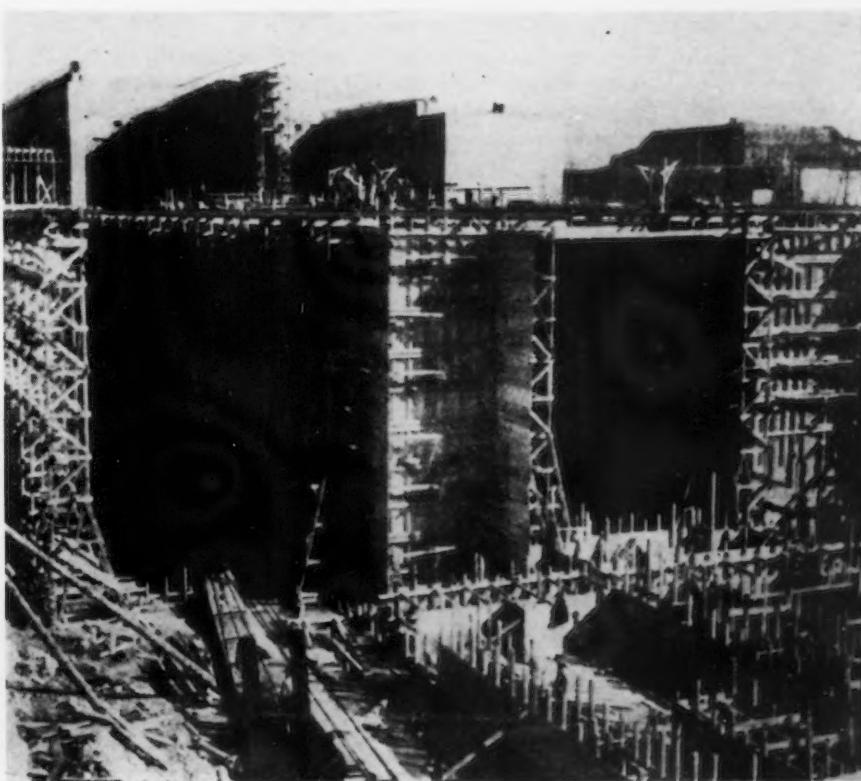
### Steel Firms Achieve Gain In Tons Loaded on Each Car

Washington

• • • ODT recently described the effect of its General Order No. 18 on two large steel companies. The order which establishes maximum limits for loading of carload freight is "resulting in substantial savings of cars and motive power," ODT said. The steel companies reported that they had increased loadings in November over October, from 44.8 to 49.9 tons a car in one case, and from 48.2 to 54.3 tons in the other case.

**GARAGES FOR U-BOATS:** This photo, reproduced from a German Propaganda magazine, shows two of the bombproof shelters for German submarines constructed somewhere on the coast of France. The great concrete and steel structures shelter the submarine raiders while they are being serviced and repaired. British and U. S. bombings of known U-boat bases, such as those at Lorient and St. Nazaire, have caused the Nazis to speed up construction of these shelters.

International News Photos



## NEWS OF INDUSTRY

### **Consair to Build Patrol Bombers at New Orleans**

• • • Production of a new model Navy patrol bomber by Consolidated Aircraft Corp. was announced recently following the Navy Department statement that Consolidated had acquired the Nash-Kelvinator aircraft plant that is partially completed at New Orleans. The original project was undertaken for the construction of dive-bombers by Nash-Kelvinator,

but the contract was cancelled about a month ago.

Capt. William Nelson, production representative in the office of the production vice-president of Consolidated, will be the acting division manager of the company's New Orleans plant. L. O. Cedarwall has been appointed New Orleans division engineer, and R. M. Zerbe, who was in charge of training and selective service at San Diego, will act as administrative engineer at the new plant.

## **Why put up with 3 Months' Life when tires like these last a year or more?**



a hard-facing overlay of Coast Metals, no appreciable wear is evident after a year's continuous service!

By making parts, that are subjected to wear, exceptionally resistant to abrasion, impact, and shock, Coast Metals hard-facing assures longer equipment life. It eliminates the need for frequent repairs and replacements, reduces shutdowns, and steps up production.

Easily applied either by the electric welding arc or the oxy-acetylene torch to new or old parts of ferrous metals, Coast Metals hard-facing is today's wartime answer to solving difficult wear-resistance problems. Our engineers will gladly tell you how it can meet your particular needs.

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### **Cited for Award**

#### **ARMY-NAVY "E"**

Advance Plating Co., Detroit.  
Aircraft Fitting Co., Cleveland.  
American Chain & Cable Co., Inc.,  
Wright-Manley Mfg. Division, York, Pa.  
American Ship Building Co., Lake Erie  
Plant, Buffalo.

American Steel & Wire Co., Worcester,  
Anthony Co., Inc., Streator, Ill.  
Atha Works, Crucible Steel Co. of  
America, Harrison, N. J.  
Guy F. Atkinson Co., George Pollock  
Co., Roosevelt Base, San Pedro, Cal.  
Austin Co., Naval Air Station, Seattle.  
Babcock & Wilcox Co., Refractories  
Division, Augusta Works, Augusta, Ga.  
Bethlehem Steel Co., Terminal Island  
Yard, Terminal Island, Cal.  
B G Corp., New York.

Broderick & Bascom Rope Co., St.  
Louis (renewal star).  
Brown Shipbuilding Co., Houston.  
Brown & Root, W. S. Bellows, Colum-  
bia Construction Co., Naval Air Station,  
Corpus Christi, Texas.

Buffalo Forge Co., Buffalo.  
Byrne Organization, Training Base,  
Solomons, Md.  
Canister Co., Phillipsburg, N. J.  
Cleveland Automatic Machine Co.,  
Cleveland.  
Cocheco Woolen Co., East Rochester,  
N. H.  
Crane Co., Chicago Works, Chicago.  
Cummins Engine Co., Columbus, Ind.  
Fulton Siphon Co., Knoxville, Tenn.  
Henry Ericsson Co., Naval Training  
Station, Great Lakes, Ill.  
Fairbanks, Morse & Co., Beloit, Wis.,  
Freeport, Ill., and Three Rivers, Mich.  
General Electric Co., Pittsfield, Mass.  
Gerstein & Cooper Co., South Boston.  
Gonic Mfg. Co., Gonic, N. H.  
Granite City Steel Co., Granite City, Ill.  
James E. Graves, Inc., Marblehead,  
Mass.

Gray Marine Motor Co., Diesel Engine  
Plant, Gasoline Engine Plant and Ship-  
ping Division, Detroit.  
Harmon Construction Co., Cowen-  
Norton Construction Co., Tankersley Con-  
struction Co., Naval Reserve Aviation  
Base, Norman, Okla.  
Harrington & Richardson Arms Co.,  
Worcester.

Horton Mfg. Co., Fort Wayne, Ind.  
Hosdred Co., Inc., Huntington, Ind.  
Hubbard & Co., Emeryville, Cal.  
International Business Machines Corp.,  
Endicott, N. Y.  
Kansas City Structural Steel Co., Kan-  
sas City, Kan.  
Keokuk Electro-Metals Co., Keokuk,  
Iowa.  
Koppers Co., American Hammered Pis-  
ton Ring Div., Baltimore.  
Lebanon Woolen Mills, Lebanon, Tenn.  
Lincoln Bleachery & Dye Works, Lons-  
dale, R. I.  
Marine Iron & Shipbuilding Co., Du-  
luth, Minn.  
Maryland Drydock Co., Baltimore.  
John E. Mitchell Co., Dallas Plant,  
Dallas, Texas.  
National Munitions Corp., Carrboro,  
N. C.  
Oldbury Electro-Chemical Co., Niag-  
ara Falls, N. Y.  
Panish Controls, Bridgeport, Conn.  
Pidgeon Thomas Iron Co., Memphis,  
Tenn.  
Portland Woolen Mills, Inc., Portland,  
Ore.  
Quincy Barge Builders, Quincy, Ill.  
Ranco, Inc., Columbus, Ohio.  
Republic Steel Corp., Central Alloy  
District, Massillon, Ohio.  
Sacramento Engineering & Machine  
Works, Sacramento, Cal.  
St. Marys Mfg. Co., St. Marys, Ohio.  
Star Iron and Steel Co., Tacoma, Wash.  
Stromberg-Carlson Telephone & Mfg.  
Co., Rochester, N. Y.  
S. G. Taylor Chain Co., Hammond, Ind.  
Thermador Electrical Mfg. Co., Los  
Angeles.  
Henry G. Thompson Co., New Haven,  
Conn.  
Tyson Roller Bearing Corp., Massillon,  
Ohio.  
Vitale Fireworks Mfg. Co., New Castle,  
Pa.

Walworth Co., South Boston.  
Wauregan-Quinebaug Mills, Inc., Wau-  
regan, Conn.

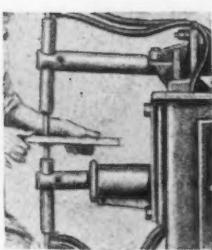
# CONSISTENT RESULTS in HI-SPEED WELDING

with

**EC&M**

**TYPE LWZ  
WELDER  
CONTACTORS**

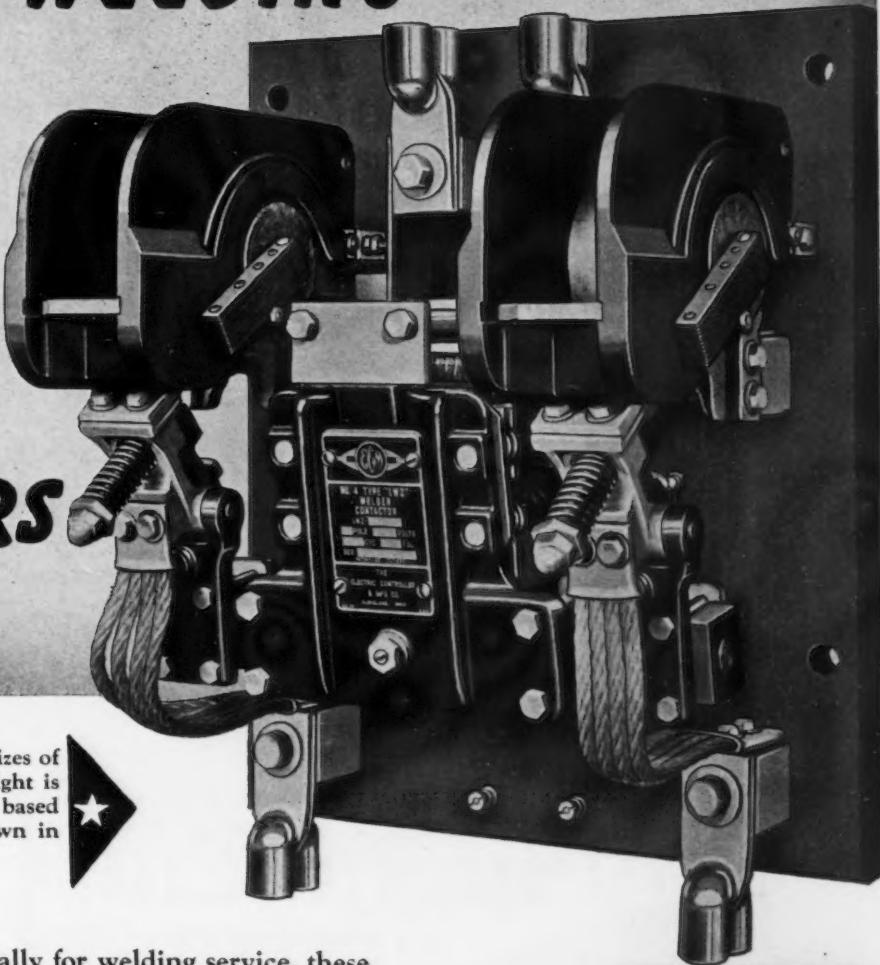
EC&M Builds six standard sizes of welder contactors. At the right is the No. 4W size. Ratings are based on duty cycle curves as shown in Bulletin 1211.



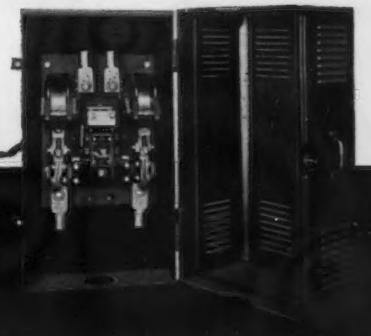
Designed especially for welding service, these heavy-duty LWZ Magnetic Contactors insure good welds at low cost. Readily accessible contact-adjustment means high-speed uniform opening and consistent welding results.

All contacts are pure copper, cold-formed by a special process providing high Brinnell hardness throughout their thickness. Proper cushioning and skillful design eliminate bounce in both opening and closing. Continuous capacity operating coils are capable of frequent operation in welder service and are well suited for "heater" and similar applications where the contactor may be closed for a long period of time.

High in arc-handling ability, low in upkeep, these EC&M Type LWZ Contactors have no equal. Ask for illustrated Bulletin 1211.



Convenient contact-adjustment makes possible consistent results through high-speed, uniform opening.



**THE ELECTRIC CONTROLLER & MFG. CO.**

2698 E. 79th Street

CLEVELAND, OHIO

**NEWS OF INDUSTRY**

**WAREHOUSE PRICES**

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

CITIES	SHEETS			STRIP		Plates (1/4 in. and heavier)	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh	\$3.35	\$4.00	\$4.75	\$3.60	\$3.20	\$3.40	\$3.40	\$3.35	\$3.65	\$7.45	\$5.75	\$8.40	\$6.75
Chicago	3.25	4.10	4.85 <sup>1</sup>	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Philadelphia	3.55	4.63	4.90	3.95	3.31	3.55	3.55	3.85	4.06	7.31	5.86	8.56	7.18
New York	3.58	4.60 <sup>2</sup>	5.00	3.96 <sup>6</sup>	3.51	3.76	3.75	3.84	4.09	7.60	5.90	8.84	7.19
Detroit	3.43	4.30	4.84 <sup>1</sup>	3.43	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30 <sup>1</sup>	4.75 <sup>4</sup>	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Boston	3.71	4.68	5.11	4.06	3.46	3.85	3.85	3.98	4.13	7.77	6.07	8.91	7.26
Birmingham	3.45 <sup>3</sup>	4.78	4.75 <sup>1</sup>	3.70 <sup>3</sup>	3.55 <sup>3</sup>	3.55 <sup>3</sup>	3.55 <sup>3</sup>	3.50 <sup>3</sup>	4.43	.....	.....	.....	.....
St. Louis	3.39	4.24 <sup>2</sup>	4.99 <sup>1</sup>	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.80	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23 <sup>2</sup>	4.98 <sup>1</sup>	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Baltimore	3.50	5.00	5.05	4.00	.....	3.70	3.70	3.85	4.04	.....	.....	.....	.....
Cincinnati	3.42	4.37 <sup>2</sup>	4.92	3.67	3.45	3.65	3.68	3.60	4.00	7.89	5.99	8.50	7.10
Norfolk	3.85	4.50	5.40	4.10	.....	4.05	4.05	4.00	4.15	.....	.....	.....	.....
Washington	3.60	5.10	5.15	4.10	.....	3.80	3.80	3.95	4.03	.....	.....	.....	.....
Indianapolis	3.45	4.25	5.01 <sup>1</sup>	3.75	3.28	3.70	3.76	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85	4.77	5.52 <sup>1</sup>	4.20	.....	4.15	4.15	4.10	4.42	.....	.....	.....	.....
Memphis	3.85	4.66	5.26	4.10	.....	3.95	3.95	3.90	4.31	.....	.....	.....	.....
New Orleans	3.95	4.95	5.25	4.20	.....	3.90	3.90	4.10	4.60	.....	.....	.....	.....
Houston	3.75	5.43	5.25	4.30	.....	5.25	5.25	3.75	4.50	.....	.....	.....	.....
Los Angeles	4.95	7.15	5.95	4.90	.....	4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
San Francisco	4.55	7.55	6.60	4.50	.....	4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
Seattle	4.65 <sup>7</sup>	6.63	5.70 <sup>7</sup>	4.25	.....	4.75	4.45	4.20	5.75	8.00	.....	.....	.....

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: <sup>1</sup> 500 to 1499 lb. <sup>2</sup> 400 to 1499 lb. <sup>3</sup> 400 to 3999 lb. <sup>4</sup> 450 to 1499 lb. <sup>5</sup> 1000 to 1999 lb. <sup>6</sup> 0 to 1999 lb. <sup>7</sup> 300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. \* 12 gage and heavier, \$3.43. <sup>f</sup> Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

## WHAT CONSTITUTES GOOD SPRINGMAKING PRACTICE?

THE RIGHT MATERIAL  
TOOL DESIGN  
MANUFACTURING EQUIPMENT  
TESTING  
HEAT TREATING

Of all the factors that are involved in springmaking, by far the largest slice is contributed by experience. Before you make hard-and-fast specifications for springs, let Dunbar experience analyze your requirements. It has often paid off in the form of simplified design, savings, and better performance. *In our experience, nothing can take the place of experience.*

**Dunbar Bros. Co.**

DIVISION OF ASSOCIATED SPRING CORPORATION

BRISTOL, CONNECTICUT

"Quality Springs Since 1845"



### Two New Contracts Are Authorized by DPC Washington

• • • Defense Plant Corp., RFC subsidiary, has authorized the following contracts:

Shell Chemical Co., San Francisco, to provide additional machinery and equipment in California at a cost in excess of \$5,000,000, making a total commitment of more than \$14,000,000.

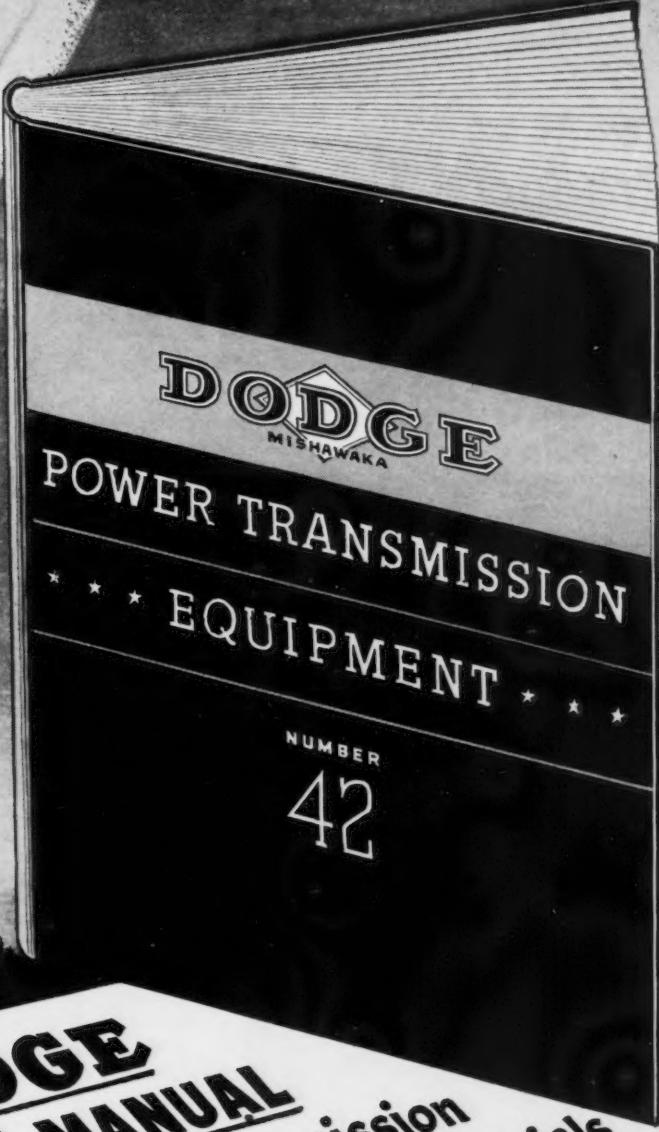
Southern California Gas Co., Los Angeles, to provide additional plant facilities in California at a cost in excess of \$500,000, making a total commitment of more than \$4,000,000.

### Kohler Co. Authorized To Expand Plant Facilities

• • • The Kohler Co., Kohler, Wis., now converted to war production, has been authorized by the Defense Plant Corp. to spend more than \$2,500,000 for expanding and improving its plant facilities.

### T.C.& I. Awards Medals Birmingham, Ala.

• • • Ninety-four Tennessee Coal, Iron & Railroad Co. employees with a total of 2615 years of work to their credit have received service medals in the fourth quarter of 1942 in recognition of their efforts, the company's president, Robert Gregg, said Jan. 4. Four of the employees have been with T.C.I. for 40 years and 10 for 35 years.



This **DODGE**  
**WARTIME MANUAL**  
Helps Solve Power Transmission  
Problems and Save Critical Materials

THIS Dodge Wartime Manual of Mechanical Power Transmission has been compiled to assist in solving wartime power problems — to conserve power, increase production and save critical materials.

It is being released at a time when conservation of motors, power and critical materials is of vital importance. It is the "How Book" of the Dodge program aimed at helping industry to increase production — built around the fighting slogan — "put all your power in the job."

The new Dodge catalog offers alternate power transmission appliances that save critical metals — and help to throw more scrap into the fight. It presents power transmission equipment that steps up production — saves time — modernizes and increases productivity of present equipment — quickly — economically — effectively.

Between the covers of this new catalog, you will find "The Right Drive for Every Job" — Dodge D-V drives — bear-

ings — pulleys — clutches and other power transmission appliances designed for use on individual, multi-motor and modern group drives.

Modern planned mechanical power transmission is a potent weapon ready now to wage war on power and material waste — to get more battle power out of horsepower.

Write today on your firm letterhead for the Dodge Wartime Manual of Mechanical Power Transmission.

**DODGE MANUFACTURING CORPORATION**  
Mishawaka, Indiana, U. S. A.

THROW ALL YOUR SCRAP  
INTO THE FIGHT!

BUY U. S. WAR BONDS  
FOR VICTORY

**DODGE**  
MISHAWAKA

THE RIGHT DRIVE FOR EVERY JOB

PUT **ALL** YOUR POWER IN THE JOB

## Class B Product Classification

[This list supersedes the Class B product lists published Nov. 2 and Nov. 14, 1942]

### CLASS B—GROUP I

Aircraft equipment and components (selected).  
Bearings, ball and roller (except main thrust bearings for ships).  
Blowers (see Fans, blowers and exhausters).  
Brake actuating mechanisms, air.  
Brakes, automotive—air and hydraulic.  
Burners, combination oil and gas—industrial.  
Burners, gas.  
Burners, oil—industrial.  
Busways and bus ducts.  
Capacitors, power (except radio and radar).  
Capacitors, radio and radar.  
Carburetors (except aircraft).

Circuit breakers, air.  
Coaxial cable, radio frequency.  
Compressors and dry vacuum pumps, reciprocating—air and gas.  
Condensers, radio and radar.  
Condensers, steam—surface, jet and barometric (except pumps and instruments).  
Condensers, synchronous and frequency changers (over 500 K. W. capacity at 0.8 power factor).  
Control valves and regulators, industrial type (for plant facilities, etc.).  
Conveyors and conveying systems.  
Crystal assemblies, radio and radar.  
Electric motor control equipment (except gun fire controls and aircraft controls).  
Engines, internal combustion.  
Exhausters (see Fans, blowers and exhausters).

Fans, blowers and exhausters.  
Filters, radio and radar.  
Frequency changers (see Condensers, synchronous).  
Generators, electric (see Motors and generators).  
Generator sets, steam-turbine.  
Heat exchangers.  
Instruments, combat type (except fire-control equipment, aircraft and navigation instruments).  
Instruments, industrial type (for plant facilities, etc.).  
Microphones, radio and radar.  
Motors and generators, electric.  
Panel boards and distribution boards.  
Pressure vessels.  
Pulverizers, coal.  
Pumps, dry vacuum (see Compressors).  
Pumps, hand-operated.  
Pumps, reciprocating.  
Pumps, rotating.  
Rectifiers, mercury arc power.  
Regulators, induction type.  
Resistors, radio and radar.  
Sockets, radio and radar.  
Speakers, radio and radar.  
Speed changers, mechanical and hydraulic.  
Stokers, industrial (over 36 square feet grate area).  
Switches, knife and enclosed.  
Switchgear.  
Test sets, standard, radio and radar.  
Transformers, power and distribution.  
Transformers—reactors, radio and radar (in-

An article titled "CMP Is A Must" appears on pages 92-93. Story on CMP Regulation No. 1 is on page 94. New forms for use under CMP appear on page 95. Priority news of the week is on page 96.

cluding coils and chokes, other than IF and RF).  
Transformers, specialty (natural draft dry type).  
Tubes, radio and radar.  
Turbines, gas.  
Turbines, hydraulic.  
Turbines, mechanical drive—steam.  
Turbo-blowers and turbo-exhausters, centrifugal—multistage.  
Turbo-blowers and turbo-exhausters, centrifugal—single stage.  
Turbo-blowers, turbo-exhausters, rotary.  
Vibrators, radio and radar.  
Wheel assemblies, automotive type.

### CLASS B—GROUP II

Abrasive products, manufactured (synthetic and natural).  
Agricultural machinery as described in groups 1, 2, 3, 4 and 5 in WPB Order L-170 (earth working, fertilizing, spraying machinery, etc.).  
Agricultural machinery as described in groups 6, 7, and 8 in WPB Order L-170 (harvesting, haying machinery, etc.).  
Agricultural machinery as described in groups 12 and 16 in WPB Order L-170 (farm wagons and trucks, dairy equipments, etc.).  
Agricultural machinery as described in groups 9, 13, 14, 15, 17, 18, and 19 in WPB Order L-170 (farm elevators, barn yard and poultry farm equipment, irrigating equipment, farm pumps, etc.).  
Air-conditioning equipment (see Refrigeration).  
Aircraft equipment and components (selected).  
For details see list arranged by classes of products.  
Alarm and signal systems, protective.  
Animal and fish oil machinery and equipment.  
Animal traps and cages.  
Anodizing equipment.  
Apparatus, laboratory (see Instruments).  
Apparel findings (see Hooks and eyes).  
Asbestos building materials.  
Asbestos textiles (metallic yarn, friction materials, mechanical packings, and gaskets).  
Automotive accessories and replacement parts (except spare parts for military vehicles).  
Automotive repair shop special machinery and equipment.  
Baby carriages and similar equipment.  
Bag filling and closing machines.  
Bag ties, metal.  
Bakery machinery.  
Barrels, steel (see Drums).  
Baskets and hampers, veneer.  
Batteries, dry cell.  
Batteries, storage.  
Bearings, journal and sleeve (see Bushings).  
Bedsprings and mattresses.  
Bells and gongs, non-electric.  
Bending machines—roll, plate, pipe, and other structural shapes.  
Bicycles.  
Blast detonating equipment.  
Boilers, low-pressure, cast-iron.

# TIME IS THE VITAL ELEMENT

*In waging a modern war time is the vital element on the production front as well as on the fighting front. The urgent necessity is to get more fighting equipment to the fighting front faster and faster and in greater quantities. It takes less time to get T & W Forgings onto the assembly line because in sixty seconds skilled T & W Die Designers*

*may accomplish work that will save hundreds of hours in forging and machining a quantity of forgings. Ask a T & W Forging Engineer about forging dies that gain time and conserve metal.*

T & W FORGINGS  
USUALLY COST LESS  
AT THE  
POINT OF ASSEMBLY

**TRANSUE & WILLIAMS**

STEEL FORGING CORPORATION · ALLIANCE, OHIO

Sales Offices in New York, Philadelphia, Chicago, Indianapolis, Detroit and Cleveland

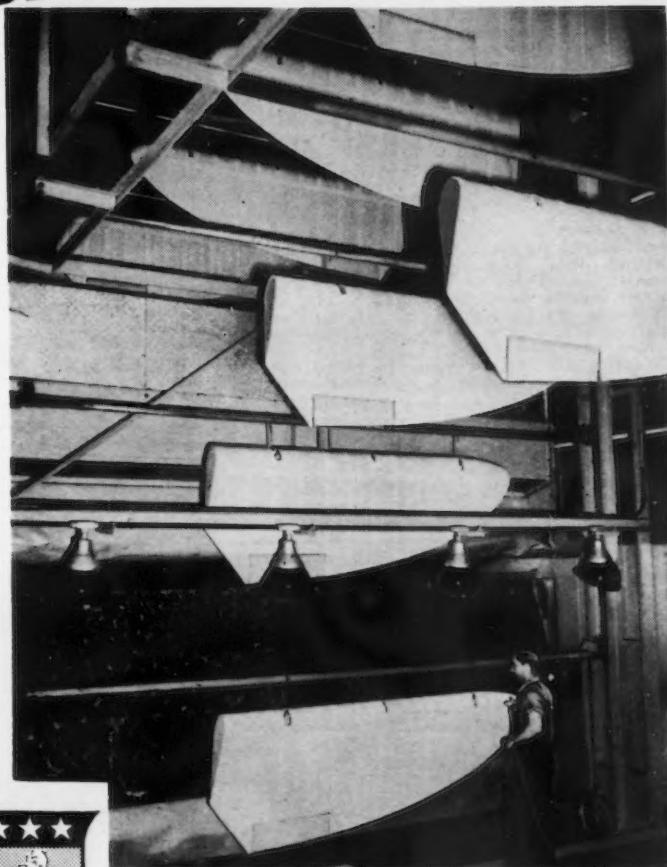
# ★ PLANE PARTS PRODUCTION INCREASED <sup>(CENSORED) %</sup> WITHOUT INCREASING FLOOR SPACE!

\* How Alvey-Ferguson Conveyor System Utilizes Overhead Waste Space To Eliminate Bottlenecks In Fleetwings' Finishing Operations . . .

PROBLEM: Parts to be finished were light in weight but large in area. How could such parts be stored and moved, *while drying*, without the addition of huge floor areas or the creation of a serious production bottleneck?

With the cooperation of Fleetwings' plant engineering staff, Alvey-Ferguson engineers designed and built an "endless-stream" conveyor system which required no floor space! Unused space overhead was utilized to move the parts at exactly the right speed for continuous processing.

Photo at right—Operator sprays one side of fabric-covered aircraft tail surface as A-F Conveyor brings tail-piece down slowly in front of spray booth. Tail-pieces returning from opposite spray booth, where other side has been sprayed, are visible at top.



At Left—Double-chain overhead A-F Conveyor, from which tail-pieces are suspended, is driven at the right speed to provide drying time before parts return to unloading level. Speed can be changed by adjustable-speed pulley shown in lower half of illustration.

Whatever your products handling, material handling or metal products washing problem, our experienced engineers can solve it for you. Without obligation on your part, write, wire or telephone The Alvey-Ferguson Co., Dept. IA, Disney Street, Oakley Station, Cincinnati, Ohio.

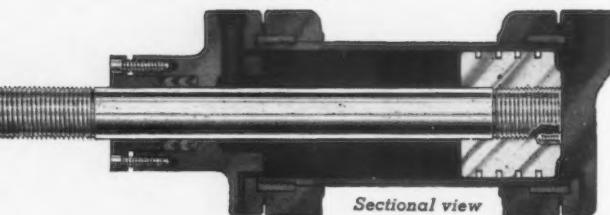
**ALVEY-FERGUSON**  
*Conveyors*  
AND PRODUCTS  WASHING MACHINES

## NEWS OF INDUSTRY

Boilers, low-pressure, steel.  
 Bolts, nuts, rivets (except aluminum), washers, screws, and pins (cotter, clevis, brake, knuckle, and taper).  
 Boring machinery, earth and rock (see Drilling).  
 Bottling machines.  
 Boxes, wooden, wire-bound.  
 Boxes and crates, wooden, nailed.  
 Boxes and drums, plywood.  
 Brazing alloys.  
 Broom, brush, and mopmaking machinery.  
 Buckles (see Hooks and eyes).  
 Building mesh, metal.  
 Building products, nonmetallic mineral.  
 Building products, sheet-metal (see Sheet-metal building products).  
 Building products, structural metal (see Structural metal building products).  
 Bunks and berths, metal.  
 Burners, gas conversion (domestic).  
 Burners, oil (domestic).  
 Bushings, journal bearings and sleeve bearings.  
 Buttons (see Hooks and eyes).  
 Can making and can closing machines.  
 Canning plant machinery.  
 Cans, metal, as defined by WPB order M-81.  
 Carbon brushes.  
 Carbon products, industrial.  
 Cars and locomotives, underground mine haulage.  
 Case packers.  
 Case sealing machines.  
 Castings, iron.  
 Ceramic manufacturing machinery.  
 Cereal manufacturing machinery.  
 Chains, except anchor.  
 Chemical producing machinery, including bleaching machinery for fats and oils, chlorine cells, colloid mills, degreasing machinery, and electrolytic cells (for water decomposition).  
 Church goods.  
 Clocks and watches, including chronometers.  
 Closures, glass, home canning, as defined by WPB order M-104.  
 Closures, glass, except home canning, as defined by WPB order M-104.  
 Coal-cutting machines.  
 Coils, blast heating.

Cold cathode lighting systems (see Fluorescent).  
 Collapsible tubes, including clips.  
 Communication equipment—special military.  
 Construction equipment, tractor mounted, including bulldozers, bulldozers and power control units.  
 Construction machinery, power cranes and shovels, draglines, buckets, stiff-leg derricks and dredges.  
 Construction machinery, such as road brooms, concrete buggies and carts, bins, center line marking equipment, road discs, ditchers, aggregate dryers, joint and crack filling machinery, road forms, form tamping machines, mud jacks, portable snow loaders, tamping rollers, scarifiers, concrete towers, contractors' crawler wagons, and similar equipment.  
 Construction machinery—scrapers, maintainers and graders.  
 Construction machinery—winches and hoists, contractors' elevating.  
 Construction material mixers, spreaders, pavers, surfacers, finishers, tampers, vibrators, and related construction machines.  
 Construction material processing equipment, including asphalt plants and portable crushers.  
 Containers, paper—consumer type, including paper bottles, milk bottle caps and closures, folding cartons (stitched), set-up boxes (stitched), and fiber cans (metal ends).  
 Conveyors, heating.  
 Conveyors, portable underground mine type.  
 Cooking and heating appliances, commercial and domestic.  
 Cooperage, slack.  
 Cooperage, tight.  
 Cork products, including lagging, pipe covering gaskets, and washers, daubers, textile cots.  
 Cosmetic machinery (see Drugs).  
 Cotton ginning and delinting machinery.  
 Cranes, hoists and winches.  
 Crates (see boxes).  
 Crowns, metal.  
 Crushing and grinding machinery, stationary.  
 Cutlery.  
 Cut-outs and fuse links.  
 Cylinders, gas, and ton containers.

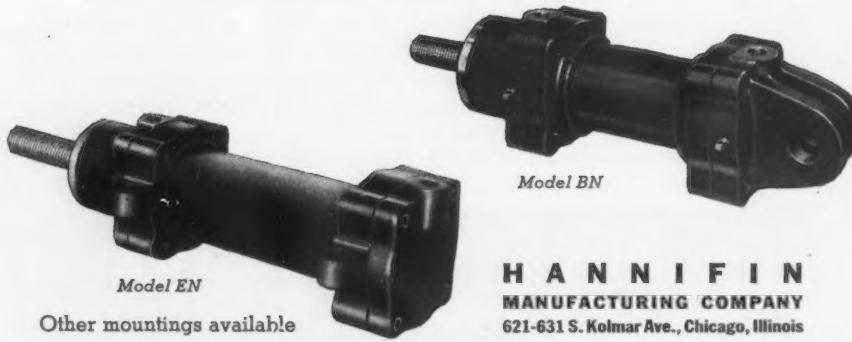
Dairy and milk products plant machinery.  
 Dental instruments, apparatus and equipment.  
 Dental supplies, and orthodontic appliances.  
 Diamond dies.  
 Die casting and moulding machines, metal.  
 Dishwashing machinery.  
 Doors and windows, metal.  
 Drilling and boring machinery, earth and rock, including core drills, rock drills, pneumatic electric coal drills, churn drills, earth borers, and horizontal augers.  
 Drilling equipment, oilfield, including rigs and accessories.  
 Drilling machinery, water well.  
 Drug, pharmaceutical, and cosmetics machinery.  
 Drums and barrels, steel.  
 Drums, fibre.  
 Drums, plywood (see Boxes).  
 Dry cleaning machinery, commercial (see Laundry, dry cleaning, and press machinery).  
 Dry kilns and redriers.  
 Dust collecting equipment, industrial.  
 Electric lanterns, portable (see Flashlight).  
 Electrical appliances, commercial.  
 Electrical appliances, domestic.  
 Electrical conduit and conduit fittings.  
 Electrical connectors.  
 Electroplating equipment.  
 Elevators, ship (except for use on aircraft carriers).  
 Elevators, shore.  
 Engineering instruments and equipment (including surveyors', drawing, and mathematical).  
 Envelopes and tablets, paper.  
 Extruding machines.  
 Ferro-cerium.  
 Fertilizer machinery and equipment.  
 Fibre drum making machinery.  
 Fibrous glass products, including pipe insulation (moulded type 60), pipe insulation (blanket type), metal mesh blankets, and dust stop filter frames.  
 Files and rasps.  
 Fire apparatus, motorized and auxiliary.  
 Fire extinguishers, portable; and stirrup pumps.  
 Fire extinguisher systems, piped, and generator sets.  
 Fire hose, hose dryers, racks, reels, and related products such as couplings, nozzles, and fittings.  
 Fish oil machinery and equipment (see Animal).  
 Fishing equipment, commercial.  
 Flanges for steel shipping containers (see Plugs).  
 Flashlight cases and portable electric lanterns.  
 Floodlights and searchlights (under 12").  
 Floor finishing and floor maintenance machines.  
 Fluorescent lighting fixtures and transformers, commercial and industrial and cold cathode lighting systems.  
 Food preparation and serving fixtures, equipment and appliances, commercial.  
 Forging machines.  
 Foundry machinery, equipment and supplies.  
 Furnaces, electric, metal-melting.  
 Furniture, wooden.  
 Fuse links (see Cut-outs).  
 Fuses, under 2,300 volts.  
 Gages and machinists' precision measuring tools.  
 Generator sets, gas engine driven.  
 Glue pots.  
 Gong (see Bells).  
 Grinding machinery (see Crushing).  
 Hairpins, bob pins, and hair curlers.  
 Hampers, veneer (see Baskets).  
 Hardware, builders'.  
 Hardware, pole line.  
 Hardware, transportation equipment.  
 Hardware, except builders', transportation equipment and pole line.  
 Heat-treating equipment, metal.  
 Heating appliances (see Cooking).  
 Heating equipment—warm air distribution equipment, registers, stove and smoke pipe.  
 Heating equipment—warm air furnaces, including furnace burner units, as defined by WPB Order L-22.  
 Heating system controls, including thermostats.  
 Hoists (see Cranes).  
 Hoists, mine types.  
 Hooks and eyes, slide and snap fasteners, buckles, buttons and miscellaneous apparel findings.  
 Hospital beds, metal.  
 Hot-water equipment, domestic (except electric).  
 Household articles as defined in WPB Order L-30 (see Kitchen).  
 Identification plates, badges, emblems, pin tickets and tags (except military).  
 Incandescent lighting fixtures.  
 Infra-red heating and drying equipment (except physiotherapy heating units).  
 Instruments and apparatus, laboratory.



Sectional view

**Make the  
Most of  
Hydraulic Power**

Write for Bulletin 35-A giving complete specifications



Model EN

Other mountings available

**HANNIFIN**  
MANUFACTURING COMPANY  
621-631 S. Kolmar Ave., Chicago, Illinois

**HANNIFIN HYDRAULIC CYLINDERS**

## NEWS OF INDUSTRY

Insulators for electric lines and equipment.  
 Jewel bearings.  
 Jewelry.  
 Kitchen articles as defined in L-30.  
 Kits, shipping (see shipping).  
 Lamp bulbs and tubes, electric.  
 Lamps, liquid fuel.  
 Lamps, portable electric.  
 Lantern, electric (except portable).  
 Laundry, cleaning, and pressing machinery.  
 Laundry machinery, domestic, as defined by WPB Order L-6.  
 Lawn mowers, hand and power.  
 Leather working machinery.  
 Lighting arrestors.  
 Lighting equipment and accessories, airport.  
 Lighting fixtures, special black-out, dim-out.  
 Lighting fixtures, street, highway, traffic.  
 Lighting fixtures, marine.  
 Locomotives, underground mine haulage.  
 Logging and sawmill machinery and equipment.  
 Lubricating equipment, industrial.  
 Machine tools, defined as non-portable, power-driven machines that shape metal by grinding or progressively cutting away chips.  
 Machine tool and metal-working machinery attachments and accessories for work-holding.  
 Machinists' precision measuring tools.  
 Magnets, electrical lifting, 5" diameter, up.  
 Marking devices (see Office supplies).  
 Mattresses (see Bedsprings).  
 Meat packing house machinery.  
 Medical instruments and equipment.  
 Medical supplies (see Surgical).  
 Metal-working machinery attachments.  
 Metal-working machines and tools, portable (power-driven).  
 Metallic tubing and hose, flexible.  
 Meters, gas and water.  
 Mine loaders, underground.  
 Mirrors.  
 Morticians' goods.  
 Moulding machines, metal (see Die-casting).  
 Musical instruments.  
 Nails (except steel wire nails) and tacks.  
 Needles, domestic.  
 Nibblers, power driven (see Shears).  
 Nuts (see Bolts).  
 Office machinery.  
 Office supplies, including marking devices.  
 Ophthalmic goods.  
 Optical and ophthalmic goods making machinery.  
 Ore dressing and coal preparation equipment.  
 Orthopedic appliances (see Surgical).  
 Packaging machines, including combination packaging machines.  
 Pails, shipping (see Shipping).  
 Paint and varnish making machinery.  
 Paper bag making machines.  
 Paper can and tube making machines.  
 Pens and pencils.  
 Petroleum refinery machinery and equipment.  
 Photographic equipment and accessories.  
 Physiotherapy apparatus, electrical.  
 Pins, common and safety.  
 Pins; cotter, clevis, brake, knuckle, and taper.  
 Pipe fittings, steel.  
 Pipe fittings, except steel.  
 Plastering bases and plastering accessories, metal.  
 Plastic molding machinery.  
 Plugs and flanges for steel shipping containers.  
 Plumbing fixtures, fittings, and trim.  
 Power cycles (except motorcycles).  
 Power-transmission equipment, mechanical.  
 Presses, baling (except agricultural).  
 Presses, hydraulic and mechanical.  
 Pressing machinery, commercial.  
 Printing trades machinery and equipment.  
 Pumps, measuring and dispensing.  
 Punches, power-driven (see Shears).  
 Radiators, cast-iron.  
 Railroad and transit maintenance-of-way work equipment.  
 Railroad and transit signal equipment.  
 Railroad and transit track equipment.  
 Railroad car accessories (except air-brake actuating mechanisms).  
 Railroad locomotives accessories (except air-brake actuating mechanisms).  
 Rapid transit and street railway car accessories (except air-brake actuating mechanisms).  
 Raspa (see Files).  
 Razors (except electric).  
 Razor blades.  
 Refrigeration and air-conditioning equipment.  
 Refrigerators, ice (domestic).  
 Rivets (see Bolts).  
 Rolling mills and allied equipment.  
 Rubber goods, mechanical (except tires, tubes).  
 Safety equipment, industrial.  
 Salt-processing machinery.  
 Sanitary ware.  
 Saws (see Tools).  
 Sawmill machinery (see Logging).  
 Scales and balances.  
 Screen cloth, insect—metal.

Screws (see Bolts).  
 Searchlights (see Floodlights).  
 Sewer cleaning equipment and machinery.  
 Sewing machines, industrial.  
 Shears, punches and nibblers—power-driven.  
 Sheet-metal building products.  
 Shipping containers, corrugated and solid fibreboard.  
 Shipping containers, fluid milk.  
 Shipping kits and pails, steel.  
 Signal systems (see Alarm).  
 Silverware, plated.  
 Silverware, sterling.  
 Slide and snap fasteners (see Hooks and eyes).  
 Smelting and refining equipment (except furnaces).  
 Spark plugs.  
 Sporting goods.  
 Spraying equipment, industrial.  
 Sprinkler systems, automatic.  
 Stirrup pumps (see Fire extinguishers).  
 Stokers, domestic (grate area 36 square feet or less).  
 Stoves, heating (domestic), including space heaters and floor and wall furnaces (except electric).  
 Stoves and ranges, cooking (domestic), including laundry stoves, hot plates, and portable ovens (except electric).  
 Strapping, metal, round and flat.  
 Structural metal building products, fabricated.  
 Sugar mill and refining machinery, cane and beet.  
 Surgical and medical instruments and equipment.  
 Surgical and medical supplies and orthopedic appliances.  
 Tablets, paper (see Envelopes).  
 Tacks (see Nails).  
 Telegraph equipment, outside plant (see Telephone).  
 Telegraph equipment (except outside plant).  
 Telephone and telegraph equipment, outside plant.  
 Telephone equipment, central office.  
 Telephone equipment, subscriber station.  
 Textile machinery.  
 Thermostats (see Heating system controls).  
 Tires and tubes.  
 Tire molds and tire mold inserts.

Tire retreading, recapping, and repairing machinery and equipment.  
 Tobacco manufacturing machinery and equipment.  
 Ton containers (see Cylinders).  
 Tools, edge; saws (except metal-cutting) and saw blades.  
 Tools, hand, except mechanics' hand service tools.  
 Tools, mechanics' hand service.  
 Tools, metal-cutting (cutting agents to be used in conjunction with machine tools).  
 Tractors, industrial (see Trucks).  
 Tractors, track-laying.  
 Tractors, wheel type, as described in Group 10 of WPB Order L-170.  
 Traffic control signals (see Lighting fixtures).  
 Trolley bus and motor bus accessories (except air-brake actuating mechanisms).  
 Trucks and tractors, industrial—hand-operated, including trailers, platforms, dollies, casters, portable elevators (platform type).  
 Trucks and tractors, industrial—power-propelled.  
 Tube cleaners.  
 Tubes, electronic (except radio and radar).  
 Tube expanders.  
 Tubes, rectifier.  
 Tubes, X-Ray (see X-Ray).  
 Umbrellas and parasols.  
 Unit heaters and unit ventilators.  
 Vacuum cleaners, industrial.  
 Valves, steel.  
 Valves, except steel.  
 Varnish making machinery (see Paint).  
 Vegetable oil machinery and equipment.  
 Washers (see Bolts).  
 Water purification equipment.  
 Welding equipment and apparatus, electric.  
 Welding equipment and apparatus, nonelectric.  
 Welding rods and electrodes.  
 Winches (see Cranes).  
 Windows, metal (see Doors).  
 Wire-drawing machinery.  
 Wire-working machinery.  
 Wiring devices and supplies, electrical.  
 Wooden box making machinery.  
 Woodworking machinery.  
 Wrapping machines.  
 X-ray apparatus and tubes.



## NEWS OF INDUSTRY

### Forms to be Filed for Hard Facing Materials

*Washington*

• • • The WPB Steel Division told producers of hard-facing materials on Monday that they must file by Feb. 15 reports on December shipments and February requirements. The reports, to be filed on Forms PD-733, 734 and 735, are required by Order L-223.

### Dummy Scrap Firms Hailed into Court

*St. Louis*

• • • The OPA filed suits in U. S. District Court here against Gus Gillerman Iron & Metal Co. and B. Lefton & Sons Iron & Metal Co., alleging that they set up "dummy" corporations by means of which they collected brokerage fees on scrap iron and steel in violation of price-ceiling regulations and asking for an injunction against further alleged violations. The petitions also named the alleged "dummy" corporations.

### New Scrap Set-Up Planned In Washington and Regions

• • • Among the changes expected in the WPB scrap set-up is the elimination of the Washington field staff. WPB regional offices are expected to take full control over operations, with the Washington office, much reduced in size, concerned only with planning and policy.

In one of the regional offices, it is believed, an entirely new scrap set-up may be tried. Graveyards, special projects, industrial salvage, etc., would, under this plan, be consolidated and a general scrap office be set up for each four or five counties, handling every sort of scrap within its geographical domain.

### December Record Set

• • • Shipments of finished steel products by subsidiary companies of United States Steel Corp. for December were 1,849,635 net tons, compared with 1,665,545 tons in November.



*British-Combine*

**AAC-AAC TURRET:** This comely British maid is putting the finishing touches to a Boulton Paul gun turret before it is dispatched for installation on a British ship. These mechanical turrets mount anti-aircraft guns and have been found to be very successful in bringing down the enemy.

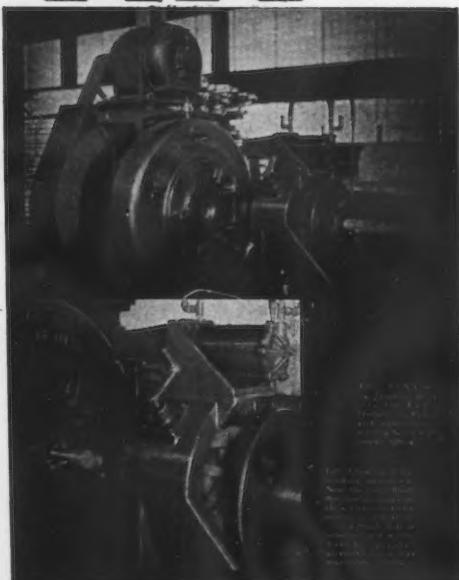
**LEWIN-MATHES Got the right answer at**

# ETNA

They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points more copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from  $\frac{3}{8}$ " to 4" and the experience to help you get the most out of this type of machine.



IF IT'S A QUESTION OF TAPERING,  
SIZING OR REDUCING OF ROUND SOLIDS  
OR TUBING...

"Ask ETNA  
About Swaging"

**ETNA**  
MACHINE COMPANY  
TOLEDO OHIO

### Seniority Protected for Transferred Auto Workers

*Washington*

• • • War Manpower Commission chairman Paul V. McNutt and WPB chairman Donald M. Nelson moved last week to prevent unnecessary shifting of workers in the automobile and automobile parts industry by extending provisions of the government's automobile industry labor transfer policy.

Their action provides that transferred automobile workers who have developed higher skills will remain at their new jobs and continue to accumulate seniority rights with their original employers unless or until they are recalled to essential war jobs in which their new skills will be used. This policy is to remain effective throughout the automobile industry.

This policy was originally worked out in conferences between labor and management in the industry.



*Official U. S. Navy Photograph*

"Sub sighted to starboard—crash diving!" The helm goes hard over. And quickly Uncle Sam's sea-dogs plummet "ash cans" over the spot where the German sea-wolf was last seen. A deep, dull roar. Then a tremendous geyser appears astern. Again the helm is hard over and the destroyer crew swings back to look for oil. For a film of oil on the surface means that they found their mark—that another Axis sub has been laid to rest in Davey Jones' locker!

Like guns and tanks and planes and one thousand and one other weapons and munitions, these "ash

cans"—depth charges to you—must be given a protective coating before they go to war. And for fast action in this important finishing operation Beatrice Steel Tank Manufacturing Company—a winner of the Navy "E" for outstanding production—uses modern DeVilbiss Spray Equipment.

Wherever painting or coating operations are required in America's war production program, DeVilbiss Spray Systems are saving precious time.

**THE DEVILBISS COMPANY • Toledo, Ohio**  
Canadian Plant: WINDSOR, ONTARIO

\* \* \*

THE COMPLETE DEVILBISS LINE CONSISTS OF: Spray finishing equipment • Automatic coating machines • Tanks for spray materials Spray booths and exhaust fans for vapor and dust elimination Air regulators, cleaners and dusters • Air compressors • Respirators Specialized hose for paint, air, water, gasoline, welding and pneumatic tools • Hose connections • Water and oil guns • Equipment to prevent offset in printing • Paint strippers • Medicinal atomizers.



# DEVILBISS SPRAY SYSTEMS

PRICES

Base Prices and Extras  
Set for Warehouses  
In 25 Centers

Washington

• • • OPA announced Jan. 7, Amendment No. 10 to Revised Price Schedule 49, (Resale of Iron and Steel Products) which set specific dollars-and-cents base prices and extras for jobbers, dealers and distributors in 25 warehousing points and 5 mill basing points. From these established prices the lowest combination price to any point in the United States is figured. The amendment is effective Jan. 11.

Products affected are hot rolled bars, structural shapes, plates, floor plates, hot rolled strip, hot rolled sheets, galvanized sheets and cold rolled bars.

The prices set by the amendment in general reflect the April 16, 1941, base date prices of the seller listed in the original schedule, and do not change the level of maximum prices for that date since no seller can exceed his own maximum price published at that date even though the new price is higher. In some instances the prices were established because the listed sellers in a city had no published price for the item or because the prices charged on the base date were not representative of the major tonnage sold. Copies of the amendment are obtainable at OPA regional offices. See THE IRON AGE Warehouse Prices on page 76 which reflect these charges.

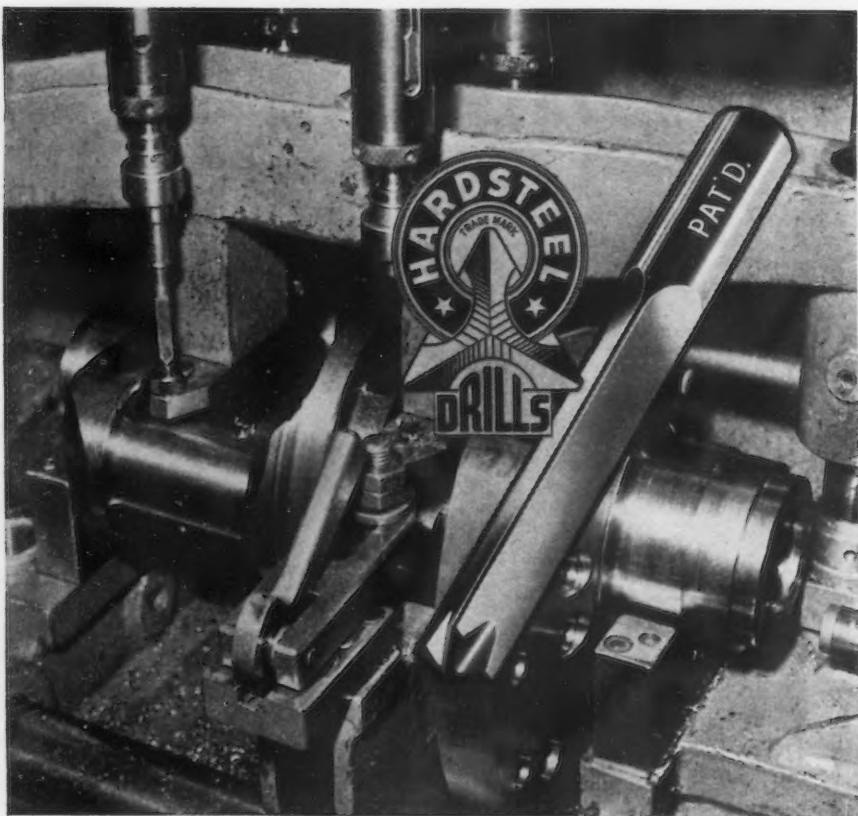
15c. Maximum Base Set  
On Secondary Aluminum Ingots

Washington

• • • A maximum base price of 15c. lb. for all secondary aluminum ingot, with certain specific exceptions, was established through Amendment 5 to Revised Price Schedule No. 2 announced Jan. 5 by OPA and effective Jan. 11.

The 15c maximum base price will permit slight price increases in some former maximums, but this is offset by the establishment of maximums below 15c. for most low-grade ingot types.

The change provides that, where specifications for the ingot require substantial additions of certain costly ingredients in the secondary smelting process, there may



## Eliminate Hardening Distortion

### Drill AFTER HARDENING with "HARDSTEEL" Drills

Wherever distortion during hardening of drilled steel parts throws drilled holes out of round or out of line—change your shop practice. Harden the part—then drill with "HARDSTEEL" without annealing, as is being done on the airplane crankshaft illustrated. Speed up your drilling—cut your rejects—insure perfect matching at assembly.



"HARDSTEEL" drills work with ease in steels hardened by any process and also the work hardening types. The harder the material—the easier it is to drill, countersink and counterbore.

"HARDSTEEL" grinds quickly on any ordinary wheel—saves time—and drills can be reground many times.

Learn all about the drilling of hardened steels and steel parts. Ask for the "HARDSTEEL" operator's manual—no charge.

**BLACK DRILL CO. • 5005 Euclid Ave., Cleveland, O.**

**YOU HARDEN IT—WE'LL DRILL IT**

**"HARDSTEEL"**  
DRILLS • REAMERS • TOOL BITS • SPECIAL TOOLS

## PRICES

be maximum prices above 15c. However, these must be reported to, and approved by OPA. Specific dollars-and-cents maximums are set for low-grade ingot. Sales of all hardeners must be reported to OPA for approval of a maximum price.

The former provision establishing maximum prices for ingot produced in melts or heats of 250 pounds or less on the basis of the highest price charged during March, 1942, is retained, although hardeners are removed from this provision.

Maximum prices for secondary aluminum ingot include freight at the carload rate up to 75c. per 100 lb. Quantity differentials apply. Copies of the amendment can be obtained from the OPA regional office.

## File Export Prices with OPA

### Washington

• • • OPA announced last week that manufacturers may file their export prices with it instead of submitting detailed price explanations on their applications to the BEW. If the prices have been filed with OPA the applicant for an export license may write "Filed, OPA" and the date on which the prices were filed. Price statements filed with OPA must contain all the information now required by the license application, or in the future, any that may be required.

## Freight Car Materials

• • • Termination of the date of the regulation controlling prices for freight car materials (Schedule 174) interchanged between freight car builders and railroads has been extended from Dec. 31, 1942, to June 30, 1943, OPA announced Jan. 2. The interchange of materials was stimulated by a requirement that car builders use from existing stocks before obtaining additional materials.

## Farm Machines Limited

• • • OPA announced Amendment No. 3 to Maximum Price Regulation No. 133 limiting the price of five critical used farm machines to stop excessive prices resulting from scarcity. The machines listed were used farm tractors (not crawlers) combines, corn pickers, corn binders and motor or tractor operated hay balers.



## RINGS, HOOKS AND END LINKS

1. When specifying chains, follow Standard Specifications as published by Chain Institute. This will insure your getting the correct type, grade and size of hooks, links and connecting links.
2. Discard bent hooks, they're dangerous.
3. Be sure hooks are properly seated.
4. Let the load rest in the center of hook, not on the point.
5. Don't insert a hook into a chain link.
6. Don't hammer a loaded hook into place.

### AMERICAN CHAIN DIVISION

York, Pa., Boston, Chicago, Denver, Detroit,  
Los Angeles, New York, Philadelphia,  
Pittsburgh, San Francisco

**AMERICAN CHAIN & CABLE COMPANY, Inc.**  
BRIDGEPORT • CONNECTICUT





To all who would like  
to obtain IngAclad ...

We are sorry we cannot supply your present needs for IngAclad Stainless-Clad Steel, unless you are in the fortunate position of holding high-rated war orders. You will be glad to know, however, that every ton you are denied today is serving America in actual war work . . . on the sea in ships galleys . . . in the camps as jacketed food kettles . . . and in speeding and protecting Food Products, Chemicals, Textiles, etc. for the fighting services.

*IngAclad makes good consumer products better, and protects them at every handling stage. Plan now to take advantage of the economies IngAclad offers when peace comes.*

## INGERSOLL STEEL & DISC DIVISION BORG-WARNER CORPORATION

310 South Michigan Avenue

Chicago, Illinois

Plants: Chicago, Ill.; New Castle, Ind.; Kalamazoo, Mich.

"*A  
Borg Warner  
Product*"

**INGACLAD**  
STAINLESS-CLAD STEEL  
AND INGERSOLL SOLID STAINLESS STEEL

### Bonderized and Lacquered Steel Sheet

(CONTINUED FROM PAGE 39)

increases with the number of cracks in the lacquer created by deformation. The deformability of the lacquer coatings on the thin phosphate base was in one case slightly better (lacquer C), and with lacquers A and B not much worse, than with the bare surface. No. 2 phosphate layer gave a lower deformability. In the case of the sanded sheets, cracks were observed on the lacquered surface, islands of lacquer being formed over areas of good adherence. Contrary to the results of v. Füller-Arndt (1941) that the brittleness of the bonderized layer is responsible for a re-

Other recent articles on bonderizing which have appeared in THE IRON AGE are: "Food in Cans," April 30, 1942; "Scarce Metal Substitutes," April 2, 1942; "Electroplaters Discuss Armament Applications," June 25, 1942; and "Accelerated and Retarded Phosphatizing Methods," Dec. 10, 1942.

duction in the flexibility of bonderized and lacquered food cans, these experiments seem to show that, as indicated by practical experience, satisfactory results can be achieved if the right type of lacquer is chosen.

In Farben-Zeitung (1941), H. Niesen has suggested that lacquered sheets could also be usefully submitted to an impact test in which a weighted hammer is dropped from a given height on to the sheet. Extensive tests have shown that on impact a can always dents over a much greater area than the indentation obtained in the Niesen apparatus. In spite of these limitations, the test was applied to the sheets under investigation here and it was found that No. 5 bonderized coating causes only a slight reduction in the impact strength, with No. 2 surface responsible for a much greater reduction. Lacquer B also gave a low impact strength in spite of a comparatively good Erichsen value. The sanded surface again showed that it was very difficult to obtain a continuous coating; sheets treated with lacquer C revealed a marked porosity.

\* Both Erichsen tests and impact

•—FEATURE CONTINUATIONS—•

tests indicated that thin bonderized coatings must be used for this type of can. The effect of pretreatment on the porosity of the lacquered coatings was also studied by applying a direct current of 8 volts to the sheets as anode and measuring the current flowing, after 3 seconds. This method renders the pores directly visible, a white deposit being formed over areas where metallic iron is exposed. To bring out the differences in the various pretreatments the better, a thin coating of lacquer was chosen. Again there were marked differences between the three lacquers investigated, lacquer C again showing the largest number of pores. Further evidence was also adduced of the difficulty in covering the sand-treated surface and it was evident that bonderizing considerably reduces lacquer porosity.

As regards the results with the thin and thick bonderized coatings, although sheets with bonder No. 2 coating were not entirely smooth after lacquering, porosity was here again much reduced. This test is important in that it showed that with coarser phosphate layers, which did not give an entirely smooth lacquering of the sheets, a reduced corrosion resistance does not necessarily follow. This is explained by the fact that the peaks of the Zn phosphate crystals are not entirely covered by the lacquer and owing to their non-metallic nature cannot give rise to electrochemical corrosion. Corrosion tests of lacquered sheets on different bonderized undercoating were made with a salt spray of 3 per cent NaCl applied for long periods. Lacquer C gave particularly bad results and tests with it were discontinued. Further tests were made with lacquers A and B and after 192 hr. exposure, the bonderized sheets still gave the best results.

As the cans after filling and sealing are subjected to a temperature of 248 deg. F. in an autoclave, tests were made with cans from sheets coated with the three lacquers by exposure to 0.5 per cent lactic acid and 3 per cent brine, the amount of iron entering solution being determined. Again the bonderized sheets gave the best results as is shown in the accompanying table. The greater adhesion of the lacquer on the sanded surface gave good results in these boiling tests. There were little differences in the

# PAGE for Wire



Yes

It's "PAGE FOR WIRE" for America at war—just as it will again be "PAGE FOR WIRE" for peace-time production.

Currently PAGE mills are at capacity for the needs of the armed forces—and for industries on war production.

## HOW ABOUT PEACE?

How about peace? PAGE considers that, too—but no wishful thinking is permitted to interfere with the one job today; which is to win this war.

In war and peace, wire is the business of PAGE.

### General Wire

Spring wire, Bond wire, Telephone wire, etc.

### Shaped Wire

Half-round, triangle, hexagon, octagon, keystone, channel, etc., in diameters up to  $\frac{3}{8}$ ", end section areas to .250 sq. inches.

### Stainless Steel Wire

Shaped as above and round.

### Welding Wire

Stainless Steel in a range of analyses and diameters from which it is easy to choose the electrode of correct size and that will provide a deposit equal to the Stainless being welded. Also electrodes for welding all other steels—all electrodes being handled by local PAGE Distributors.

**TODAY** steel for any purpose is hard to get. And mills are jammed. So we continue to suggest buying wire carefully and using it carefully. If under these all-out war conditions you are planning things that must wait for production on peace, you will find us more than able and willing to help work with you on any of the jobs that call for the use of wire.

# PAGE WIRE

## PAGE STEEL AND WIRE DIVISION

Monessen, Pa., Atlanta, Chicago, New York, Pittsburgh,  
San Francisco

*In Business for Your Safety*



AMERICAN CHAIN & CABLE COMPANY, Inc.

FEATURE CONTINUATIONS

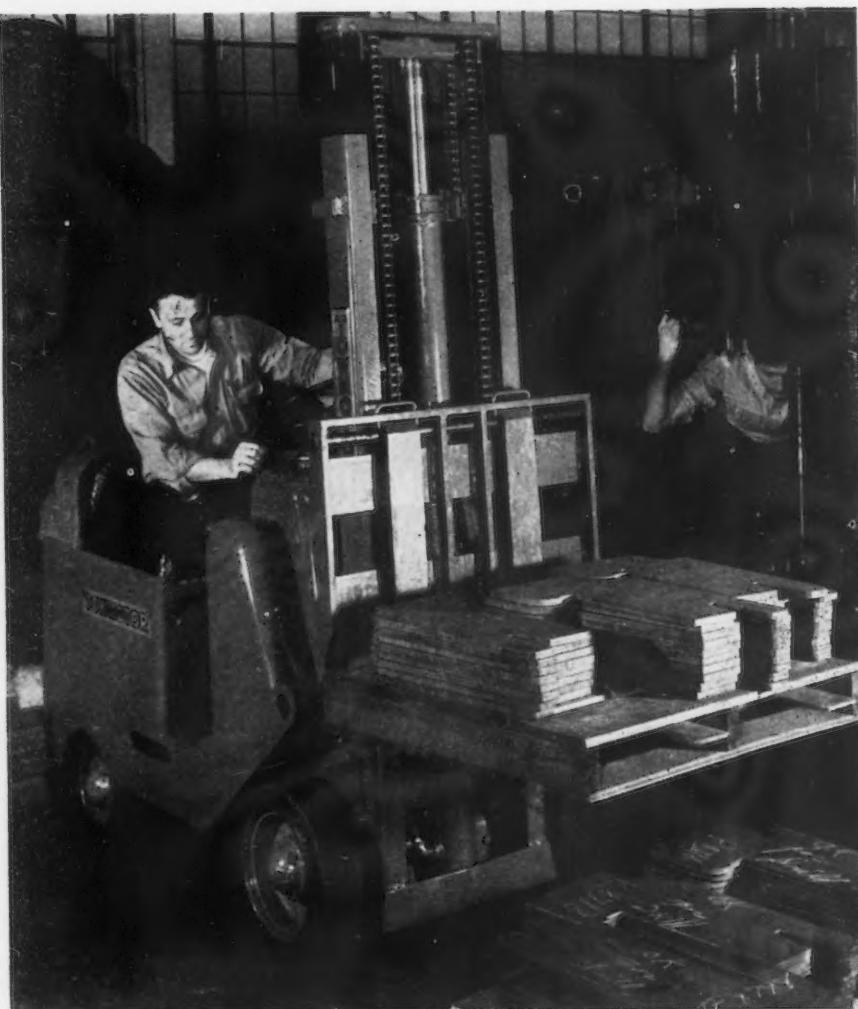
amounts of Fe dissolved with the weaker brines. The general result was that the bonderized cans were largely unaffected by treatment, the ends of the cans from the sanded sheet showed signs of corrosion, while on the bare sheets the lacquer had begun to peel off in places.

Further autoclave tests were carried out with longer exposure of the sheets, roughly the same results as before being obtained with exposures to both lactic acid and brine. Although the lacquer adheres better to the sanded surface than to the bare, partial peeling is observed and behavior towards the reagents is not as good as that of the bonderized sheets.

These corrosion tests indicate that the phosphate layer applied by bonderizing provides a bond between the surface of the metal and the coating of lacquer, thus increasing the adhesion of the latter to the surface, and, since it is not non-metallic considerably increasing the resistance to corrosion of the subsurface. The sanded surface also provides good lacquer adhesion but is powerless to prevent corrosion of the underlying metal. It is necessary to bear this in mind as it is frequently stated that the chief result of bonderizing is to produce a roughening of the surface for better adhesion of the coating.

It is evident that much importance attaches to the correct choice of the lacquer. Stove-dried artificial resin lacquers are practically the only ones being used at present, their corrosion resistance being much greater than the types hitherto employed. Drying temperatures are mainly above 350 deg. F. The chief representatives of can lacquers now in use belong to the group of phenol and alkyl resins; mixtures of resins are also used, all sharing a satisfactory stability to exposure to water and resistance to boiling. German production and utilization of bonderized and bonderized-lacquered cans, has made rapid strides since 1937. One of the difficulties to be overcome was the need for suitable plants for welding the cans.

The first plant for bonderizing and lacquering cans was installed at the Züchner works in 1938 by the Göhring & Hebenstreit concern of Radebeul (Dresden), bonderizing and lacquering being conducted in separate units.



**P**roduction can be  
accurately and efficiently controlled  
by regulating the flow of materials  
which in turn can be economically  
accomplished by **TOWMOTOR**

**THE 24-HOUR ONE-MAN-GANG**



**TOWMOTOR COMPANY • 1230 E. 152 ND STREET, CLEVELAND**  
STRAIGHT — GAS POWERED INDUSTRIAL TRUCKS EXCLUSIVELY — SINCE 1919

## Steel Production in 1942 Sets Peak of 86,092,209 Tons

• • • Production of steel ingots and castings by the steel industry of the United States for 1942 established a new record of 86,092,209 tons, announced the American Iron

and Steel Institute. The total exceeds by 3,255,000 tons the previous record production of 82,836,946 tons in 1941. Production in December amounted to 7,303,179 tons.

### YEAR 1941

Based on Reports by Companies which in 1941 made 98.5% of the Open Hearth, 100% of the Bessemer and 87.8% of the Electric Ingots and Steel for Castings Production

Period	Estimated Production—All Companies								Calculated weekly production, all companies (Net tons)	Number of weeks in month
	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL			
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,274,780	99.0	451,806	76.0	195,766	89.1	6,922,352	96.8	1,562,608	4.43
February.....	5,669,425	99.1	378,536	70.5	182,393	91.9	6,230,354	96.5	1,557,589	4.00
March.....	6,457,641	101.9	460,225	77.4	206,137	93.8	7,124,003	99.6	1,608,127	4.43
1st Quarter .....	18,401,846	100.1	1,290,567	74.8	584,296	91.6	20,276,709	97.7	1,576,727	12.86
April.....	6,137,613	100.0	395,056	68.6	221,510	104.1	6,754,179	97.6	1,574,401	4.29
May.....	6,362,245	100.4	444,079	74.7	238,241	108.4	7,044,565	98.5	1,590,195	4.43
June.....	6,098,171	99.4	458,848	79.7	235,732	110.8	6,792,751	98.1	1,583,392	4.29
2nd Quarter .....	18,598,029	100.0	1,297,983	74.3	695,483	107.8	20,591,495	98.1	1,582,744	13.01
1st 6 months .....	36,999,875	100.0	2,588,550	74.6	1,279,779	99.7	40,868,204	97.9	1,579,753	25.87
July.....	6,085,100	94.4	489,297	85.0	237,827	85.7	6,812,224	93.3	1,541,227	4.42
August.....	6,244,353	96.6	495,761	85.9	257,382	92.6	6,997,496	95.6	1,579,570	4.43
September.....	6,054,418	96.9	500,768	89.8	256,568	95.5	6,811,754	96.3	1,591,531	4.28
3rd Quarter .....	18,383,871	96.0	1,485,826	86.9	751,777	91.2	20,621,474	95.1	1,570,562	13.13
9 months .....	55,383,746	98.6	4,074,376	78.6	2,031,556	96.4	61,489,678	96.9	1,576,658	39.00
October.....	6,423,329	99.4	533,060	92.4	279,679	100.6	7,236,068	98.9	1,633,424	4.43
November.....	6,194,679	99.0	488,822	87.5	277,384	103.0	6,960,885	98.2	1,622,584	4.29
December.....	6,387,865	99.0	481,813	83.7	280,637	101.2	7,150,315	97.9	1,617,718	4.42
4th Quarter .....	19,005,873	99.1	1,503,695	87.8	837,700	101.6	21,347,268	98.3	1,624,602	13.14
2nd 6 months .....	37,389,744	97.5	2,989,521	87.3	1,589,477	96.4	41,968,742	96.7	1,597,592	26.27
Total.....	74,389,619	98.8	5,578,071	80.9	2,869,256	97.9	82,836,946	97.3	1,588,741	52.14

Note.—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,430,102 net tons open hearth, 134,187 net tons Bessemer and 49,603 net tons electric ingots and steel for castings, total 1,613,892 net tons; based on annual capacities as of Jan. 1, 1941, as follows: Open hearth 74,565,510 net tons, Bessemer 6,996,520 net tons, electric 2,586,320 net tons. Beginning July 1, 1941, the percentages of capacity operated are calculated on weekly capacities of 1,459,132 net tons open hearth, 130,292 net tons Bessemer and 62,761 net tons electric ingots and steel for castings, total 1,652,185 net tons; based on annual capacities as follows: Open hearth, 76,079,130 net tons, Bessemer 6,793,400 net tons, Electric 3,272,370 net tons.

### YEAR 1942

Based on Reports by Companies which in 1941 made 98.5% of the Open Hearth, 100% of the Bessemer and 87.8% of the Electric Ingots and Steel for Castings Production

Period	Estimated Production—All Companies								Calculated weekly production, all companies (Net tons)	Number of weeks in month
	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL			
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,328,128	95.4	490,864	86.0	305,930	96.3	7,124,922	94.7	1,608,335	4.43
February.....	5,791,813	96.7	453,543	88.0	275,700	96.2	6,521,056	96.0	1,630,264	4.00
March.....	6,574,701	99.1	493,294	86.4	324,916	102.3	7,392,911	98.2	1,668,829	4.43
1st Quarter .....	18,694,642	97.0	1,437,701	86.7	906,546	98.3	21,038,889	96.3	1,635,994	12.86
April.....	6,346,707	98.8	454,583	82.2	321,023	104.4	7,122,313	97.7	1,660,213	4.29
May.....	6,600,376	99.5	454,054	79.5	332,460	104.7	7,386,890	98.2	1,667,470	4.43
June.....	6,247,302	97.2	452,518	81.8	322,335	104.8	7,022,155	96.4	1,636,866	4.29
2nd Quarter .....	19,194,385	98.5	1,361,155	81.2	975,818	104.6	21,531,358	97.4	1,654,985	13.01
1st 6 months .....	37,889,027	97.8	2,798,856	83.9	1,882,364	101.5	42,570,247	96.9	1,645,545	25.87
July.....	6,350,047	95.7	453,684	79.6	345,093	96.3	7,148,824	94.5	1,617,381	4.42
August.....	6,420,496	96.6	467,313	81.8	345,642	96.3	7,233,451	95.4	1,632,833	4.43
September.....	6,297,201	98.0	437,950	79.4	331,933	95.7	7,067,084	96.5	1,651,188	4.28
3rd Quarter .....	19,067,744	96.8	1,358,947	80.3	1,022,668	96.1	21,449,359	95.5	1,633,615	13.13
9 months .....	56,956,771	97.4	4,157,803	82.7	2,905,032	99.5	64,019,606	96.4	1,641,528	39.00
October.....	6,757,696	101.6	461,895	80.9	365,273	101.7	7,584,864	100.1	1,712,159	4.43
November.....	6,378,661	99.1	458,426	82.9	347,473	99.9	7,184,560	97.9	1,674,723	4.29
December.....	6,471,465	97.6	475,124	83.4	356,590	99.5	7,303,179	96.6	1,652,303	4.42
4th Quarter .....	19,607,822	99.4	1,395,445	82.4	1,069,336	100.4	22,072,603	98.2	1,679,802	13.14
2nd 6 months .....	38,675,566	98.1	2,754,392	81.3	2,092,004	98.3	43,521,962	96.8	1,656,717	26.27
Total.....	76,564,593	97.9	5,553,248	82.6	3,974,368	99.8	86,092,209	96.9	1,651,174	52.14

Note.—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons Bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, Bessemer 6,721,400 net tons, Electric 4,225,890 net tons.

## Manpower Commission Names Eighty-Five Surplus Labor Areas

• • • The War Manpower Commission has named 85 industrial areas as zones of surplus labor during a reclassification of areas for the guidance of Government procurement agencies in the placement of war contracts. The 272 industrial areas now established by WMC have been divided into four major classifications with regard to labor supply. These include: 31 areas listed as Group I which have acute labor shortages; 95 areas in Group II, having a current balance of labor; 61 areas in Group III, having an anticipated balance of labor supply and demand; and 85 in Group IV, having a labor surplus.

This information is being supplied to the various procurement agencies of the Government and will serve as one of the deciding factors in the placement of war contracts. It should be emphasized here that this consideration will be only one factor in contract placement along with ability of a prospective contractor to produce the necessary volume on time, necessity of installing tooling and other matters.

The information also will prove of value to industry in helping to locate excess supplies of workers who may be prevailed upon to accept employment in other locations. Contact with workers in these surplus labor areas can easily be made by application to the nearest United States Employment Service office.

The War Manpower Commission lists the following areas as Group IV having surplus labor supplies:

Alabama: Birmingham, Montgomery; Arkansas: Fort Smith, Little Rock; Connecticut: Middletown, Torrington; Florida: Miami, St. Petersburg; Georgia: Augusta, Columbus, Rome; Illinois: Bloomington, Danville, Galesburg, Herlin, Peoria, Quincy; Indiana: Muncie; Iowa: Sioux City; Missouri: Cape Girageau, Joplin, St. Joseph, Springfield; Montana: Billings; Nebraska: Lincoln; New Hampshire: Concord, Manchester, Nashua; New Mexico: Albuquerque; New York: Central Long Island, New York, Yonkers; North Carolina: Asheville, Durham, Greensboro, Winston-Salem, Rocky Mount; Ohio: Coshocton, Portsmouth, Steubenville, Zanesville; Pennsylvania: Altoona, Scranton; South Carolina: Columbia, Greenville; Tennessee: Chattanooga, Knoxville, Nashville; Kentucky: Lexington, Owensboro, Paducah; Louisiana: Alexandria, Baton Rouge, Monroe, Shreveport; Maine: Bangor, Lewiston; Massachusetts: Boston, Fall River, Fitchburg, Haverhill, Lowell, Salem, Taunton; Michigan: Grand Rapids, Kalamazoo;

Mississippi: Jackson, Vicksburg; Texas: Abilene, El Paso, Laredo, Lubbock, San Angelo, Wichita Falls; Vermont: Burlington; Virginia: Richmond, Roanoke, Danville, Lynchburg; West Virginia:

### Steel Employment Drops 3000 in Month; Wages Up

• • • A drop of 3000 was recorded in steel employment for November compared with October, a total of 632,000 compared with 635,000 according to statistics prepared by the American Iron and Steel Institute. Reflecting a steady downward trend, this compares with 645,000 employees in November a year ago.

Wages in the steel industry averaged \$1.093 an hour in November for an average work week of 39.4 hr. This compares with an average wage of \$1.077 an hour in October and \$0.99 a year ago. The average work week in October was 39.9 hr. and 37.6 hr. a year ago.

Steel payrolls for November were \$122,816,000, a decline from the \$126,627,000 paid in October and compares with \$109,856,000 a year ago.

Charleston, Huntington, Parkersburg, Wheeling; Wisconsin: Oshkosh, La Crosse, Sheboygan.

### Wyckoff Hires Women For Cold Drawn Plant Jobs

Pittsburgh

• • • Due to the growing tightness in the manpower situation, Wyckoff Drawn Steel Co. will soon have more than 20 per cent of its Ambridge plant payroll composed of women.

The company inaugurated a "women in industry program" last December and it is believed this marks the first time women have been employed in plant jobs in the cold drawn steel industry, according to company officials. Approximately 100 women are now employed in the company's Ambridge plant on jobs formerly held by men. All are younger women and are replacing only men who have gone into the armed forces.

In hiring women workers, preference is given to the wives and

sisters of employees in the armed service. They are holding various jobs throughout the mill and are employed on all shifts. Applicants have been taken from district residents in Ambridge and nearby territory.

According to the company, after less than two months operation of this new plan, these women employees have shown up well on the job and are exhibiting excellent spirit and cooperation.

### WLB Approves Raise For American Bridge Co.

Washington

• • • WLB has sanctioned a wage increase affecting 1500 employees in the shipyard of American Bridge Co., U. S. Steel subsidiary at Ambridge, Pa., which will adjust their rate to conform with rates being paid at the Dravo Corp.'s yards just four miles away. The increase, which raises the pay schedule from a base of 72½c. to 80c. and from a top of \$1.11 to \$1.20, had been agreed upon by the company and the USA-CIO and after reference to the Navy had been turned over to WLB for decision. The increase must still be approved by the Shipbuilding Stabilization Committee as such inland yards had not been included in the Committee's established stabilization zones.

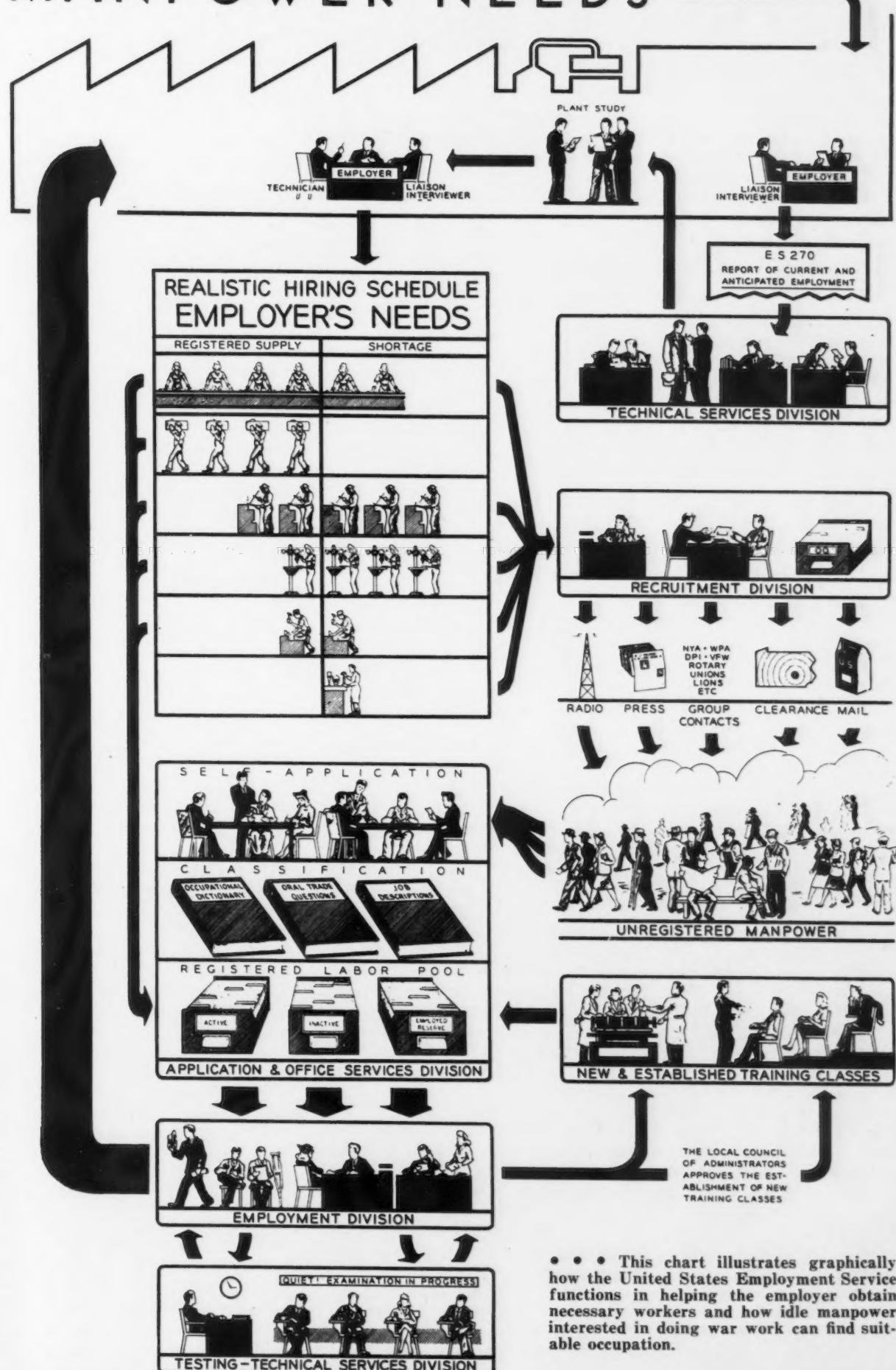
### USES Not Slated As Universal Hiring Agency

Washington

• • • Paul V. McNutt said last week that the United States Employment Service would not be utilized as the exclusive hiring and recruitment agency for war industry, thereby refuting the guesses which have been current. McNutt, however, made it plain that the WMC was empowered by Executive order to do this if necessary.

It is recognized that the USES has been authorized to act as the exclusive hiring agency in those areas which have been termed "critical" labor areas by the WMC and it has been the consensus that these areas might conceivably later take in most of the country or at least the great majority engaged in war industry.

# HOW TO FILL EMPLOYERS' MANPOWER NEEDS



• • • This chart illustrates graphically how the United States Employment Service functions in helping the employer obtain necessary workers and how idle manpower interested in doing war work can find suitable occupation.

# The CMP Is a "Must"

By TOM C. CLARK

• • • After a very good start, the Controlled Materials Plan recently has been hitting some rough spots. The meetings around the country, every one of them a huge success, put the plan across so far as enthusiasm was concerned and American industrialists rolled up their sleeves ready to tackle another job.

Industry had taken various preference ratings, directives, PD-1-a's, even PRP in stride knowing there was no over-all plan, yet with confidence the real answer would be found. Finally, here it was, the CMP. But when industry asked, "What are we to do?" the answer came back. "Nothing, until you are called upon."

To wait and do nothing is difficult for an American industrialist, particularly in a time like this. He wants action and wants to know whether he will be called upon to furnish these bills of material or applications for allotment numbers. If he does not make application for an allotment number, will he get an allotment number anyway? Perhaps he should have been told, everyone concerned should have been told, to make out an application, but that is over the dam now.

As the plan was explained, the industrialist got a glimpse of its mechanics but he did not get in understandable terms the theory behind the plan. If an American industrialist is to have confidence and wait he has to know the "Why" of the waiting.

As this article will try to show, the American industrialist must have confidence. The CMP is the last plan and it will work—has got to work, and he has to wait because the theory of the plan requires it. CMP really commences to operate after requirements have been determined and it will take some time to get those requirements together. As many as ten or more manufacturers may be making the same war part or the same item. Obviously the scarce material requirements of each is to all intents and purposes the same. Under such circumstances it would serve no useful purpose if each manufacturer furnished practically identical requirements

for the same item.

That a particular manufacturer is not called upon to supply a bill of material for an item or part does not mean that no manufacturer has been called upon to furnish that bill of material. The determination of requirements is up to the agencies and they are intelligently busy about the job. The manufacturer has to have confidence and he has to wait.

**CMP is a war plan and could**

• • • This article, written by a former chief priority specialist for a large steel company, explains why the new Controlled Materials Plan must be made to work. There is nothing new or frightening in CMP, but what is new is the balance it introduces into production schedules, says the author.

not be made to work under a peacetime economy because in peacetime the heavy requirements of the agencies do not exist. On the other hand the PRP could be operated to federally regiment all industry in peace time. This point has not been considered by critics of the CMP who have also failed to consider the consequences which are sure to follow its failure. Undoubtedly the military would take over all production and the WPB would become an innocuous agency. There is nothing to give assurance that the military is equipped to do or could do the job, while the WPB, if given the required support and co-operation from industry can do an admirable job. Therefore, all who have anything to do with the CMP should know all there is to be known about it.

It requires war thinking to understand CMP. The basic idea in this kind of war thinking is scarcity. The difficulty of the American industrialist commences here as most of his production problems have always been in terms of abundance. Now the job is to pare intelligently the requirement to the available supply and then intelligently distribute that supply to the approved requirements.

For many reasons PRP could

not do the job. Under PRP there is no sound method for determining the importance between requirements. There is no sound method in PRP for determining what the requirement really is. Another defect in PRP is that there is no possible way under it to bring production schedules into balance. PRP, however, served its purpose and gave industrialists a chance to adjust to war thinking.

It is to the credit of industry that the fundamental principle of CMP came from certain industrialists and that it was accepted in the face of stiff opposition, probably mostly through the backwash which followed the resignation of one branch chief from the WPB. The basic idea of these industrialists was very simple and is embedded at the core of CMP. Their reasoning went like this:

"This supply of steel, of copper, of aluminum—the critical materials—it's like a bank and the trouble is we have been overdrawing the bank. We know we have approximately 5,300,000 tons of finished steel products per month. We don't particularly need to worry about what kind of products because we know we have about 30 per cent more finishing capacity than we have ingot making capacity. If we overdraw month after month, we go bankrupt."

That is exactly what was happening. The depositors (consumers) pushed, scrambled and fought until marine boilers with precious plates arrived at shipyard sites before the ways were finished and tanks came off assembly lines without tracks.

The industrialists reasoned further: "We must cut the requirement down to the available supply. But to do that we must find out what the requirement is. We know and must assume the requirement to be greater than the supply. That is war thinking and that presupposes scarcity. Now, after we know that requirement in terms of these scarce materials, then in terms of tanks, guns, planes, shells, ships, etc., we must cut our programs for those finished items down to the available supply of scarce materials. The programs have to be in balance and the manufacturing schedules of the producers have to be in balance."

This is the fundamental and

## NEWS OF INDUSTRY

simple idea of CMP and it is industry's own idea. Industry thought it up and gave the basis of the plan to the WPB. That the plan is full of strange words and difficult definitions does not endanger its fundamental soundness.

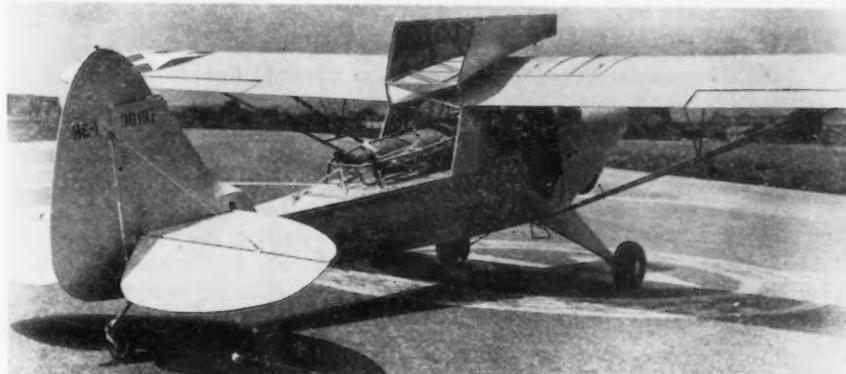
As the idea came out of the WPB "thought hopper" there are four clearly defined parts to it: First, the determination of requirements; second, the determination of the available supply; third, the paring down of the requirements to the available supply and fourth, the distribution of that supply to the adjusted requirement. There is only one important term in the whole CMP which every industrialist does not use daily in his work, and that is the Requirements Committee. The plan might just as well have been called the "Quota Plan" or the "Budget Plan"—as it was at one time—and the committee called the "Budget Committee." The Requirements Committee is the arbit-

*The Class B products list in full starts on page 78 of this issue. Story on CMP Regulation No. 1 is on page 94. New forms under CMP appear on page 95. Priority news of the week is on page 96.*

trator, the balance wheel in the whole plan whose job it is to see that the requirements are cut to the available supply, police the issuance of checks and see that enough money is in the bank.

Some industrialists, without a proper understanding of the theory and operation of the plan, have complained about the work required to get up a bill of materials. This is the most important tool with which the plan operates. For every fabricated job for every plant in the country there is already in the files a bill of material or the information therefor, probably in such form that only few changes, if any, are required to make it acceptable under CMP. The bill of material does not have to be on the CMP form and anyone requested to furnish a bill of materials should first determine from the agency or his contractor making the request whether his available data are not sufficient.

The application of an allotment number is in a similar category as industrialists have been filling out PD-25a applications with practically the same information for



**AMBULANCE PLANE:** The Navy HE-1 built by Piper Aircraft Corp. is a single litter ambulance plane powered by 100 h. p. Lycoming engine. It cruises well at 100-miles per hour and is used by Navy to speed to scenes of crack-ups to pick up injured pilots and crewmen and shuttle them to base hospitals. Fuselage turtledeck hinges upward and forward to permit easy access to litter.

some time. There is nothing new in the allotment number or its transmission as priority ratings have been applied for, extended and re-extended for over a year and a half by every industrialist who bought materials.

For months we have been piling up oddly assorted items of war equipment manufactured out of these scarce materials. In certain calibres we have more shells than guns to shoot them, and in others, more guns than we have ammunition; landing mats of steel more abundant than planes to take off of them; the program of Naval construction has been changed any number of times from light cruisers to heavy cruisers and then back again. Requirements for war items are bound to change, in both volume and kind, with shifts in the war.

CMP solves this difficulty by specifying that each agency's requirement shall be broken down by programs, which means by heavy cruisers, light cruisers, EC-2 boats, each type of landing barge, etc. Programs must be thoroughly planned. After the available supply of materials has been divided up and allotted among the agencies, the programs must be adjusted to that supply. The required flexibility is provided by quarterly allotments.

With the provision that allotment numbers can be issued into the future up to a specified percentage of any current allotment a reasonable stability is insured to the programs, volume being the only important question undetermined. This matter of program

stabilization to the available supply and program flexibility within it, is one important key to the plan, the other being the balancing of production or manufacturing schedules.

By balancing manufacturing or production schedules is meant that all materials and parts required for the finished fabricated item will be delivered to the manufacturer at the required time in order that the finished fabricated item may be really finished. No more planes without propellers or tanks without tracks. CMP solves this difficulty as follows: first, the three controlled materials—steel, copper and aluminum—are the scarcest and most important basic raw materials. If requirements for these materials are kept down to the available supply there should be enough of the other materials—lumber, rubber, cordage fibres, etc.—to complete the programs but if there is not, anyone of those other materials can at any time be made a controlled material. Second, a priority rating with an allotment number takes preference over a priority rating without an allotment number. Thus, a manufacturer with an approved program allotment number is assured of getting his bolts and nuts, valves, etc., required to take a finished item off the line. Third, the time at which he can order the delivery to him of the controlled materials and other materials is geared to the time when he really requires them by a production or manufacturing schedule initiated by the agency and controlled by his contractor. This is the other important key to the CMP.

There are many administrative points about the plan that require clarification and undoubtedly many will be changed. If too many changes are made too frequently the plan itself will cause the loss of that stability which its operation will otherwise bring about. An elaborate procedural review should be set up for changes and amendments to it with a strong administrative control.

The administration of the plan can and should be vastly decentralized but changes and amendments must be kept to a minimum.

An avenue must be kept open for intelligent and constructive criticism of the plan and industry must take the lead in this respect.

## CMP Clarified by New Regulation No. 1

• • • **CMP Regulation No. 1** is one of six orders explaining and setting forth the plan formally. The orders to be issued are: CMP Regulation No. 3; Preference Ratings; CMP Regulation No. 4, Warehouses; CMP Regulation No. 5, Maintenance, Repair and Operating Supplies; CMP Regulation No. 6, Construction and Facilities. CMP Regulation No. 2, already issued, dealt with inventories.

A complete list of the claimant agencies with identifying symbols which will be a part of the allotment number has been issued. These are:

- (W) War Department, except Ordnance which is identified by (O).
- (N) Navy.
- (M) Maritime Commission.
- (C) Aircraft Resources Control.
- (L) Lend-Lease Administration.
- (E) Board of Economic Warfare.
- (S) Office of Civilian Supply.
- (A) Department of Agriculture.
- (T) Office of Defense Transportation.
- (R) Office of Rubber Director.
- (F) Facilities Committee of WPB.
- (P) Petroleum Administration for War.
- (H) National Housing Agency.

### Grouping of Small Allotments

A consumer who has received a number of different allotments for the same form of controlled material and who has occasion to make several allotments of small quantities thereof may combine in one allotment any number of such small allotments provided that:

- (1) Each of the small allotments so combined is for less than the following amounts:  
Carbon steel (including wrought iron but excluding tool steel). . . . . 5 tons  
Carbon tool steel . . . . . 500 lb.  
Alloy steel (excluding stainless and tool steel) . . . . . 1 ton  
Stainless steel . . . . . 500 lb.  
Alloy tool steel . . . . . 500 lb.  
Copper or copper base alloys . . . . . 200 lb.  
Aluminum . . . . . 100 lb.
- (2) Each of the combined allotments is for the same month; and
- (3) In lieu of an allotment number he shall endorse the combined allotment made by him with a statement declaring suitable authority.

General allotment procedure, allotments by Claimant Agencies to prime consumers producing Class A products, allotment by Industry Division to producers of Class B products, allotments by prime and secondary consumers, advance allotments, allotment number, bills of materials, applications for allotments and other information serving as a basis for allotments are set forth in the regulation in substantially the same manner as provided in the CMP Plan.

Every allotment, according to the regulation, made by a con-

sumer must include or be accompanied by authorization of a production schedule with respect to the products to be supplied to him and no consumer shall authorize a production schedule for a secondary consumer unless he currently allots the controlled materials to fulfill the schedule.

Production schedules for Class A producers are to be authorized by Claimant Agencies on form CMP-4A. Claimant Agencies may in particular cases authorize a production schedule through an Industry Division. Production schedules for secondary consumers producing Class A products are to be authorized by the consumer for whom such Class A product is to be produced on the form on which the related allotment is made. The delivery dates specified on the delivery order are to constitute an authorization of the minimum production schedule required to permit delivery on such date.

Class B product production schedules are to be authorized by the appropriate Industry Division or in special cases by a Claimant Agency on form CMP-4B. A consumer receiving allotments from several persons shall obtain separate authorized production schedules from each.

Prior to authorizing a production schedule, a Claimant Agency, Industry Division or consumer may furnish a tentative production schedule to be used as a basis for submitting requirements but such action is not to constitute authorization of the schedule.

### Small Orders

WPB has taken steps to permit the production of small orders without formal allotment. A "small order" means a delivery order for one or more Class A products placed with the manufacturer thereof by a consumer, where the aggregate amounts of controlled material required to fill such order, together with all similar delivery orders placed by the same consumer with the same manufacturer calling for delivery during the same month, do not exceed the following:

Carbon steel (including wrought iron)	1 ton
Alloy steel	400 lb.
Copper and copper base alloys	100 lb.
Aluminum	20 lb.

Delivery orders may be placed in advance of receiving allotments, and converted into authorized controlled material orders on receipt of allotments.

### Time for Placing Authorized Controlled Material Orders (Partial List)

Product	Number of days in advance of first day of month in which shipment is required
Hot rolled bars and semi-finished	75
Bars—cold finished	105
Sheet and strip—hot and cold rolled	105
Plates—hot rolled	75
Tool steel:	
Hot rolled products	90
Cold finished products	120
Cold finished bars:	
Carbon bars—standard sizes	70
Carbon bars—odd sizes, etc.	100
Alloy bars	105
Plates and shapes:	
Carbon steel plates	30
Carbon steel structural shapes	45
Alloy steel plates and shapes	75
Pipe	30
Sheet and strip:	
Sheet—hot rolled—16-gauge and heavier	30
Sheet—hot rolled—17-gauge and lighter	45
Sheet—cold rolled—galvanized—long terme	45
Strip—hot rolled (low carbon)	30
Strip—cold rolled (low carbon)	45
High carbon cold rolled strip, etc.	60
Hot rolled carbon bars and semi-finished:	
Except for carbon bars heat treated and annealed	30
Carbon bars heat treated and annealed	60
Tin mill products	30
Tubing:	
Carbon steel—hot finished	30
Carbon steel—cold drawn:	
1½" and larger	45
Under 1½"	75
Alloy steel—hot finished	90
Alloy steel—cold drawn:	
1½" and larger	110
Under 1½"	120
Steel castings:	
(When patterns are available):	
500 lb. and under	30
Over 500 lb. to 5000 lb.	45
Over 5000 lb. to 30,000 lb.	60
Over 30,000 lb.	75
Wire and wire products:	
Hot rolled wire rods	30
Merchant trade products	30
Manufacturing wires:	
Low carbon .0475" and heavier	45
Low carbon under .0475"	60
High carbon	45
Wire rope and strand:	
5/8" dia. and over	75
9/16" dia. and under	105
Welded wire-reinforcing fabric	45
COPPER	
Brass mill copper and copper base alloy products:	
Copper and non-refractory alloys	45
Refractory alloys	60
Wire and cable products:	
Bare wire and cable	10
Weatherproof wire and cable	14
Foundry copper and copper base alloy products:	
Castings (rough):	
Small simple castings to fit 12" by 16" flask	7
Large intricate and centrifugal	14
ALUMINUM	
All forms and shapes	45

\* \* \*

Where no time is specified in Schedule III for placing orders for a particular form or shape of controlled material, the time for placing such orders shall be subject to agreement between the consumer and the controlled materials producer, provided that no producer shall discriminate between consumers in the acceptance of orders. In the event of any disagreement, the matter should be referred to CMP.

**FOR MAKERS OF CLASS B PRODUCTS UNDER CMP:** Form CMP-4B is the form to be used in making application for allotments for controlled materials required during second quarter of 1943 in the manufacture of Class B products. Form CMP-4A is to be used by manufacturers supplying the Class B firm with Class A component parts for Class B products.

A copy of the official Class B products list issued as of Dec. 21, appears on page 78.

Form CMP-4C for application for allotment of controlled materials for construction and facilities. Prime consumers and secondary consumers will prepare four legible copies of the application form unless otherwise directed.

In general, all of these three forms are similar.

## WPB Begins Distribution of Class B List, CMP Materials

### Washington

• • • WPB began nation-wide distribution Jan. 7 of the official Controlled Materials Plan Class B product list. It includes some 500 groups of related items classified as B products, and will be used by manufacturers operating under CMP to determine whether they are Class A or Class B producers.

Only those products containing controlled materials which are included in the official list are Class B products. All other products containing controlled materials

*The Class B list appears on page 78 in this issue.*

are, by definition, Class A products. Provision has been made to expedite certain programs by designating specified B items as Class A products.

### WPB Decentralizing

#### Washington

• • • A further step toward decentralization of the WPB was taken last Friday with the granting of authority for approval of individual emergency preference ratings to the field offices of WPB. The 12 regional directors are now authorized to approve, countersign and issue individual preference ratings for emergency repair, up to and including AA-1.

In addition, the 110 district offices may for the first time grant ratings for emergency repair not exceeding \$500 in value, up to and including AA-2.

### PD-707 Relaxes M-21-d

• • • Orders for corrosion and heat-resistant steel, if approved on Form PD-707, can be completed even if rated lower than AA-5, it was made clear last Friday by Interpretation No. 3 of Supplementary Order M-21-d. The interpretation points out that this restriction does not apply to orders authorized on Form PD-707.

### ODT Creates New Branch

• • • Joseph B. Eastman, director of ODT, announced establishment,

within the Office of Defense Transportation, of a Division of Material and Equipment Requirements created to perform functions developing upon ODT in connection with its designation as the claimant agency for domestic transportation under the Controlled Materials Plan.

### Used Construction Equipment

• • • Export of used construction equipment beyond the limits of continental United States was prohibited today by Limitation Order L-196 as amended except exports made by the Army, Navy, Maritime Commission, War Shipping Administration or their agents. It also permits the export of used construction equipment where such export is specifically authorized.

### Tin Consumption Reduced

• • • Tin consumption will be reduced another 12,000 to 15,000 tons in 1943 by a new General Preference Order M-43, issued Jan. 9, to replace previous orders M-43 and M-43-a. The order which conserves the use of tin in solder and other uses is expected to cut the amount of tin used in 1943 to one half that used in 1941.

### Blackplate Orders Revoked

• • • Two orders which had been incorporated in Order M-81 as amended Dec. 9, 1942 limiting the amount and use of blackplate in

### WPB Announces 6 New CMP Claimant Agencies

• • • Six new claimant agencies to present claims for critical materials to WPB were announced this week. Each agency will nominate members to represent them on the Requirements Committee. The six new agencies, bringing the total to 13, are: National Housing Agency; Office of Rubber Director; Office of Defense Transportation; Petroleum Administrator for War; Food Administrator; Facilities Bureau of WPB.

the making of cans of various types were revoked Jan. 9. The orders were M-136 which limited the use of blackplate to certain types of cans and M-81-a which promoted the use of electrolytic tin plate.

### M-110 Amended

• • • Secondary tungsten and molybdenum chemicals, including pigments, were removed from the M-orders controlling tungsten and molybdenum in an amendment to General Order M-110 dated Jan. 9.

### Chromium Chemicals

#### Washington

• • • Consumers of Primary Chromium chemicals are no longer required to file form PD-54 with suppliers, but only with the WPB under general preference order M-18-B as amended. Users of less than 500 lb. a month will be exempt from filing form PD-54.

### Control Valves Scheduled

#### Washington

• • • By Order L-234, the WPB was given authority recently to issue directions regarding the scheduling of production or delivery of industrial thermometers, pressure gages, control valves and other industrial type instruments.

### Plumbing Fixtures

#### Washington

• • • Further Restrictions on the use of metal in the manufacture of plumbing fixtures are imposed by WPB in revised schedule XII of limitation order L-42 providing that no metal may be used in the manufacture of plumbing fixtures except for coating, nuts, bolts, screws and other items which are necessary for construction, assembly and installation.

### M-68 Series Superseded

#### Washington

• • • Petroleum Administrative Orders may now supersede WPB Conservation Orders of the M-68 series which control the use of materials by petroleum enter-

## This Week's Priorities and Prices

**Secondary aluminum ingot** prices have been set at a maximum of 15c. per lb. in Amendment No. 5 to Revised Price Schedule No. 2, effective Jan. 11. (OPA-T-477)

**Malleable iron castings** foundries have been given an alternative and easier method to be used in determining maximum prices of certain castings in Maximum Price Regulation 241. (OPA-T-480)

**Warehouse prices** for iron and steel products have been listed in Amendment No. 10 to Revised Price Schedule No. 49, effective Jan. 11. (OPA-T-479)

**Military arms** manufacturers may dispose of damaged or defective parts to scrap dealers or to smelter under amended Order L-230. (T-1523)

**Alloy steel** makers have been sent a letter granting them permission to supply sample lots of steel to manufacturers or laboratories for experimental purposes without regard to preference ratings. (T-1515)

**Primary chromium** consumers are no longer required to file Form PD-54 with suppliers, but only with the War Production Board under Order M-18-b as amended. (T-1541)

**U. S. Mines** have been granted higher preference ratings for purchase of repair and maintenance materials, and increased allotments of certain critical metals. (WPB-2329)

**Metallurgical and ceramic** grade fluorspar shipments by producers will be controlled by WPB. (WPB-2314)

**Corrosion and heat-resistant** steel orders, if approved on form PD-707, can be completed even if rated lower than AA-5, it was made clear in Interpretation No. 3 of Supplementary Order M-21-d. (T-1553)

*For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 means announcement 600 issued by the War Production Board.)*

## Revisions to The Iron Age Priorities Guide

• • • The following data, together with all intermediate weekly revisions in THE IRON AGE, should be added to THE IRON AGE Priorities Guide published with the issue of October 8 to bring the Guide up to date.

### "M" Orders:

M-15-b...Amended order simplifies rubber reporting requirements (1-9-43).  
 M-18-b...Amended order does not require consumers of primary chromium to file form PD-54 with suppliers, but only with WPB (1-7-43).  
 M-21-d...Interpretation No. 3 (1-8-43) states that orders for corrosion and heat resistant steel, if approved on PD-707, can be completed even if rated lower than AA-5.  
 M-38...Order extended indefinitely (1-2-43).  
 M-43...Amended order further cuts consumption of tin (1-9-43).  
 M-68...Amendment (1-5-43) gives PAW authority to amend or revoke petroleum conservation orders of M-68 series (1-5-43).  
 M-81...Amended order permits packing of oysters in metal cans until April 30 (1-5-43).  
 M-81-a...Revoked (1-9-43).  
 M-104...Amended order sets up quotas for packing certain items (1-4-43).  
 M-136...Revoked (1-9-43).  
 M-153...Amended order further controls distribution of acrylonitrile (1-9-43).  
 M-154...Amended order puts thermoplastics under straight restrictive control (1-9-43).  
 M-162...Interpretation No. 2 states that assembly of jewelry find-

ings containing more than 2 per cent platinum is included in prohibitions formerly announced (1-4-43).  
 M-178...Amended order further controls distribution of butadiene (1-9-43).

### "L" Orders:

L-1-g...Amended order provides for manufacture of 500 additional semi-trailer petroleum tanks (1-7-43).  
 L-1-h...Amended order reduces number of trucks to be manufactured for civilian use (1-7-43).  
 L-7-c...Schedule II sets quota for domestic non-mechanical refrigerators during the first quarter of 1943 (1-2-43).  
 L-71...Amended order modifies control over production of hearing aid batteries (1-9-43).  
 L-97...Amended order places used locomotives under regulatory control (1-2-43).  
 L-98...Amended order extends production of sewing machine repair parts (1-2-43).  
 L-157...Schedule 5 is simplification schedule covering gardening tools (1-8-43).  
 L-180...Amended order sets 1943 storage battery quota at 100 per cent of 1941 sales (1-5-43).  
 L-185...Interpretation No. 1 (1-9-43) clearly defines water heaters covered by order.  
 L-196...Amended order limits exports of used construction equipment (1-9-43).  
 L-222...Order bans production of floor sanding finishing machines and industrial vacuum cleaners (1-8-43).  
 L-230...Order amended to permit sales and deliveries of scrapped material to scrap dealers and melters (1-4-43).

prises. This shift was made by WPB last week when it delegated to the Petroleum Administrator, authority to amend or revoke orders of the M-68 series.

### Sampling Plan Renewed For NE and Carbon Steels

Washington

• • • WPB has renewed an arrangement started three months ago by which sample quantities of NE or plain carbon steels for experimental purposes can be delivered to manufacturers or laboratories, without regard to preference ratings.

Any manufacturer or laboratory wishing to obtain samples of these steels is asked to certify on the purchase order that such steel

is to be used in making tests; that quantities ordered, added to amounts already received or on order from other sources, will not amount to more than 1000 lb. of each composition.

### Fluorspar Controlled

Washington

• • • WPB last week took over control of shipments by producers to users of both metallurgical and ceramic grades of fluorspar, the former used as a flux in the open hearth furnace. Control was established under Regulation No. 1 which forbids any producer or shipper to ship fluorspar to persons appearing on restricted shipping lists, sent to producers each month by WPB.

### Warehouse Stocks Helped Washington

• • • A system of temporary supplementary quotas, designed to enable iron and steel warehouses to rebuild their stocks, were announced recently by the WPB. Order M-21-b was amended to permit a warehouse to exceed its quota for the first quarter of 1943, provided that it keeps within its total allotment for the period Jan. 1, 1942, through March 31, 1943.

The amended order also: 1. Adds woven and welded wire fence, poultry netting, barbed wire, posts and gates to the list of items which can be sold on unrated orders. 2. Increase plate quotas to 100 per cent of base period deliveries, instead of 75 per cent as formerly.

# PERSONALS

- **W. A. Cramer** has been appointed traffic manager, western district, United States Steel Corp. subsidiaries, succeeding M. N. Billings who is retiring from the position after 39 years of service in the traffic departments of the Steel Corporation subsidiaries.
- **Philip D. Reed**, chairman of the board of the General Electric Co., has resigned all of his company posts in order to continue his work in London as deputy chief of the Harriman Mission.
- **Thomas Chalmers**, now vice-president in charge of manufacturing operations, Tennessee Coal, Iron & Railroad Co., Birmingham, has assumed the duties also of vice-president in charge of raw materials. As his assistants in this new work, **A. B. Haswell**, now assistant to vice-presidents in engineering and construction, becomes assistant vice-president in engineering and construction. **R. E. Kirk**, now general superintendent of coal mines, becomes assistant vice-president in charge of raw materials and **J. M. Spearman**, now general superintendent of Fairfield Steel Works, becomes assistant vice-president in charge of manufacturing operations. **N. L. Van Tol** at present works manager, Fairfield, will be assigned exclusively to the duty of post-war research.
- **Raymond M. Dennis**, formerly general manager of Lukens' flanging department, has been appointed assistant to the president of By-Products Steel Corp., Coatesville, Pa.
- **W. W. Noble** has been appointed manager of Crucible Steel Co. of America's Pittsburgh branch sales office. **J. S. Billingsley**, former branch manager, was recently made manager of Crucible's order and scheduling department in the New York executive offices.
- **Leo Edelson**, for the past 10 years development engineer for Handy & Harman, has joined the Induction Heating Corp., New York, as executive vice-president.
- **E. M. Ford**, formerly vice-president and treasurer of Michigan Alkali Co., has been elected president of the Wyandotte Chemicals Corp., formed from consolidation of Michigan Alkali Co. and the J. B. Ford Co. The presidency was to have been occupied by Mr. Ford's father, E. L. Ford, who died Dec. 20.
- **V. Gilmore Iden** has resigned as secretary of the American Institute of Steel Construction. Mr. Iden will become industrial editor of the Bureau of National Affairs, Washington.
- **Ray F. Cronin** has been appointed president of Federal Pipe & Supply Co., Chicago. **Thomas J. Gilbride** has been appointed vice-president.
- **W. Roy Widdoes**, general manager of By-Products Steel Corp., was recently named director of personnel relations for Lukens Steel Co. and its subsidiaries. Mr. Widdoes has been with Lukens since 1912.
- **B. D. Kunkle**, vice-president in charge of the manufacturing staff of General Motors Corp., assumes the additional duties as group executive over the Cadillac, Oldsmobile, Pontiac, Canadian and Overseas operations. **W. S. Roberts**, vice-president and general manager of General Motors of Canada, Ltd., becomes his assistant.
- **Edward L. Parker**, president, Columbia Steel and Shafting Co., Edgar T. Ward's Sons Co. and Summerill Tubing Co., has been appointed a member of the production directive committee of the steel division of the WPB.
- **Bernard P. Planner** has recently been appointed a senior consultant for the Board of Economic Warfare, Non-Ferrous Metals Division.
- **Henry T. Riddick**, with the Osborn Mfg. Co., Cleveland, for the last 32 years, has been named sales service manager of the company's brush division. He replaces L. J. Bechhold, who recently resigned.
- **John A. Ross** has recently been appointed manager of Crucible Steel Co. of America's alloy sales department.
- **J. H. Cooper** has been appointed chief of the resistance welding section, General Industrial Equipment Division, War Production Board, Washington. He has been given an indefinite leave of absence by The Taylor-Winfield Corp. with whom he has been associated for the last six years as welding engineer.
- **M. M. Broad** resigned from the Grant Iron & Metal Co., Detroit, and is now associated with Fisher Iron & Metal Co., Muskegon, Mich., as president.
- **A. Frank Golick**, assistant general manager of sales of La Salle Steel Co., Chicago, has been made general manager of sales.
- **Archibald M. Hall** has been appointed acting manager of VulTEE's Eastern Division. He has recently been manager of the Fort Worth Division of Consolidated Aircraft Corporation.
- **Lt. Col. Frank A. Mickle** has been appointed chief of the simplification section in the Development Branch of the Ordnance Department Tank-Automotive Center.
- **Chester L. Wells**, who has been eastern representative of the American Society for Metals and Metal Progress for the last seven years, is now senior industrial specialist in the Conservation and Substitution Branch, WPB.
- **Joseph A. Horne** has resigned as vice-president in charge of production of the Yale & Towne Mfg. Co. and has been elected to the position of chairman of the board. Mr. Horne succeeds Mr. John Henry Towne, who died on Sept. 29. **Calvert Carey**, who has been Mr. Horne's assistant for nine years, was elected as vice-president in charge of production. He was also elected a director of the company.
- **Charles C. Fichtner** has been appointed vice-president and treasurer of the Strippit Corp., North Tonawanda, N. Y. He was formerly with the U. S. Department of Commerce, Washington, where he was chief of field service and chief of division of regional economy.
- **C. M. Ballou** has been elected president of the Steel Products Warehouse Association, Inc. One of the first duties to be assumed by Mr. Ballou will be general supervision of an intensive drive by the salesmen of all members of the Steel Products Warehouse Association in locating dormant scrap.
- **Donald MacAskill** has retired as vice-president and general manager of Canadian operations of the International Nickel Co. of Canada. He is succeeded by **R. L. Beattie**, formerly assistant vice-president.

# MACHINE TOOLS

. . . Sales, Inquiries and Market News

## Cancellations Speed Drop in Order Backlogs

Cincinnati

• • • To some of the district machine tool builders, the belief has arisen during the past week that the end of the present high production and rush of business is not too far off. In fact, in one or two instances manufacturers seem to feel that they are in good shape for probably the next six months, but didn't see much beyond that. Elsewhere, the feeling seems to be that 1943 will probably see the completion of backlogs and the general leveling off of machine tool business. Cancellations in the last month have been accelerated and new business does not show sufficient volume to indicate that it will offset the cancellations. Some manufacturers feel that in addition to the government stoppage of some new projects, part of the cause of the tremendous cancellation might also be attributed to over-ordering of new tools on the part of those failing to understand the increased capacity of modern tools as compared with those being used at the time the orders were placed.

There is also some indication of a modest easing in the labor situation, since personnel departments indicate some regular applicants for jobs, with plant forces at about their adequate level. Some plants are redoubling efforts in designing machines for peace time usage and accelerating programs in anticipation of the decline in war business.

## Cancelled War Contracts Immobilize Special Machines

Cleveland

• • • One of the most far reaching effects of the change in emphasis in war products manufacture, namely the added emphasis on planes and ships at the expense of other products, is the one that it will have in the rehabilitation of plants that tooled up to manufacture goods now deemed less necessary, and the release of such plant equipment as machine

tools, heat-treating furnaces and other machinery.

It would seem upon first examination that such equipment could readily be transferred to the plants making "preferred" war products, thus enabling a speed-up of such manufacture but in most instances this has not been possible. For example, when a contract held by a plant that started to convert its facilities last spring for manufacturing one specific item and was scheduled to go into full production within the next three months was cancelled, it was found that such equipment as was purchased or ordered is of little use in any type plan other than an arsenal.

It is estimated that nearly a half million dollars' worth of special machine tools already installed in the plant will go begging for a user, as will a substantial number of special heat-treating furnaces and other equip-

ment. Furthermore, at the time this contract was cancelled, there were a substantial number of machine tools on order that had not yet been delivered. The cancellation of these orders has resulted in what was reported to be "terrific" cancellation charges by the builders for work that had been performed on the equipment up to the time of cancellation.

Since there has been a general contract cancellation program throughout the country, it would seem highly probable that this same situation has occurred frequently and that the cost of the war is being materially upped by such procedures.

## Plant Construction Record

• • • New plant facilities and equipment established in the Chicago area in the past year totaled approximately \$569,535,000, a new all time high, according to the Chicago Association of Commerce.

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SHARON, PA.

# NON-FERROUS METALS

. . . Market Activities and Price Trends

## New Zinc Base Alloys Saving German Brass

• • • One method by which Germany is meeting her brass shortage is believed to be by substitution of zinc alloyed with small amounts of copper, aluminum and manganese. Such substitution is of course not practicable in this country, where zinc is nearly as tight as copper, but in Germany it is entirely feasible. Germany must depend almost entirely on stockpiles and salvage for copper, now being cut off from even the small amount she was probably getting from French North Africa. In contrast, she has added the substantial zinc outputs of Norway, Silesia, France and Belgium to her own production.

An article from *Metallwirtschaft*, translated by the Zinc Development Association, mentions the

use of the following rolled zinc alloys: zinc-aluminum, zinc-aluminum-copper, zinc-copper, zinc-manganese and zinc-lithium. Other German reports mention the use of mercury and iron in powder form. Some of these alloys are used in this country, primarily for die casting, but the alloying of mercury, lithium and, to any degree, iron powder, is considered by the industry here to be of mysterious and doubtful benefit.

It is thought that German zinc alloys are possibly being substituted for brass in tubing, especially for medium pressure lines, and that zinc alloy rod may be replacing brass rod for fuse components. Samples of zinc alloy pipe fittings from Germany have reached this country via England. There is little doubt that under the compulsion of necessity, Germany has made interesting advances in zinc base alloys.

## Canada Reports Gains in Non-Ferrous Production

Toronto, Ont.

• • • Canada continues to increase its non-ferrous smelting and refining industry, with further expansion expected in 1943. The Dominion Bureau of Statistics has announced that during 1941 value added by the industry totaled \$119,726,294, compared with \$98,059,287 in 1940. While no monetary statistics have been revealed for 1942, the year's non-ferrous output, it is estimated by G. C. Bateman, metals controller, will amount to more than 1,100,000 tons. The cost of ores, concentrates and other materials treated in 1941 was estimated at \$213,542,005, against \$174,274,655 in the previous year. Metals processed included gold, silver, copper, lead, zinc, aluminum, manganese, antimony, cadmium, selenium, tellurium, radium salts, uranium compounds, tin and magnesium, the last two being produced for the first time in Canada in 1941.

At present, about 40 strategic mineral projects are being assisted financially by either the Canadian or the United States government, Mr. Bateman said. Seventeen of these projects, calling for production of 46,000 tons of copper, 74,000 tons of zinc and 7000 tons of lead will be operated for Metals Reserve Co., RFC subsidiary. The Canadian government is wholly financing and operating a number of projects producing magnesium, chromite, molybdenite and tungsten.

Canada is consuming only 30 per cent of her output of aluminum, nickel, copper, lead and zinc, and is exporting the other 90 per cent to other members of the United Nations.

Mr. Bateman said that intensive search has failed to turn up any substantial manganese deposits. However, two new molybdenite deposits, in Ontario and northern Quebec, are being opened, as well as many small, high cost properties previously worked. The government is also opening a chrome property in Quebec and equipping it with a 600-ton mill which should soon be in production.

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## NON-FERROUS METALS

### Young Named Head of New Non-Ferrous Unit

• • • Howard I. Young, president of the American Zinc, Lead & Smelting Co., St. Louis, and of the American Zinc Institute, is said to have been named to head a new non-ferrous metals policy making unit in the War Production Board. Though no official announcement of the appointment or of the formation of the new unit has been made, Mr. Young is reported to have begun his new WPB duties about two weeks ago. It is believed he will be in charge of all new non-ferrous metal projects and expansion, and that these matters will no longer be under the jurisdiction of the various non-ferrous branch heads.

### New Copper Limitations

• • • WPB has prohibited the use of copper in engraving all kinds of business and social stationery in an amendment to Order M-9-c. Other changes made by the amended order prohibit the use of copper in the following articles:

Item	Effective Date
Blow torches, except in certain parts	Jan. 20, 1943
Cement flooring	Dec. 26
Hammers	Dec. 31
Screens for oil wells and water wells	Jan. 20, 1943
Adjustable stencils	Dec. 31
Atomizers, except for medical purposes and for use in the preparation of dried milk and eggs	Dec. 31
Electrical devices for the removal of scale in boilers	Dec. 31
Certain electric lamp and lighting fixtures	Dec. 31
Showers curtains	Dec. 26
Sound equipment attachments for motion picture projection machines (except for certain repair and maintenance purposes)	Dec. 31
Table flatware (except for a copper-silver strike)	Dec. 26

### Magnesium Price Cut

• • • Substantial savings to the government in the cost of airplanes and other vital war materials are expected to result from a reduction of 2c. lb. in the base price of virgin magnesium, and other reductions by the Dow

Chemical Co., announced Jan. 8 by OPA.

The reductions become effective Jan. 1 setting a base price of 20½c. lb. for virgin magnesium metal ingot.

### Year End Statistics

• • • Silver production and imports in November declined to 8,764,000 fine oz. from 9,316,000 in October, making an 11 months' total of 105,790,000 fine oz. against 132,465,000 in 1941. . . . Lend-lease and direct purchase exports are said to have absorbed more than 16 per cent of our zinc supply in the first half of 1942. . . . Mineral production in Alaska declined about 25 per cent in 1942. The year's output was valued at \$19,306,000 of which 7/8 represented gold. . . . The war program will require 700,000 tons of copper the first quarter of 1943, the War and Navy Departments have announced. . . . Last year the U. S. produced 10,250,000,000 rounds of small arms ammunition and 181,000,000 rounds of artillery ammunition.

### Camps Double Tin Can Salvage in November

Washington

• • • Quartermaster salvage units in Army camps collected more than 3,600,000 lb. of old tin cans during November, the War Department has announced. This is double the total saved in October and 150 times the amount salvaged five months ago. It is estimated that camps can salvage on the average approximately 12 lb. of tin cans per man per month.

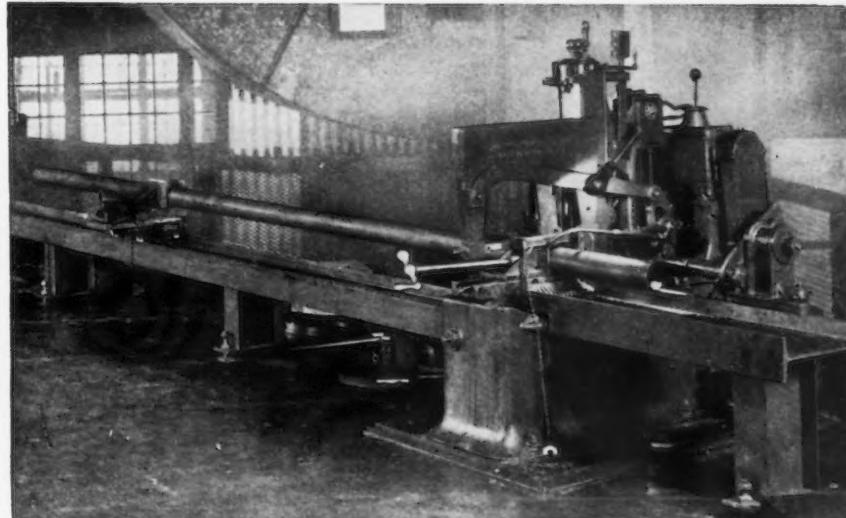
### Non-Ferrous Prices

(Cents per lb. for early delivery)	
Copper Electrolytic <sup>1</sup>	12.00
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis <sup>2</sup>	8.25
Lead St. Louis <sup>3</sup>	6.35

<sup>1</sup> Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. <sup>2</sup> Add 0.42c. for New York delivery. <sup>3</sup> Add 0.15c. for New York delivery.

### Zinc Price Change

The New York delivered price for zinc, given in footnote 2 above, has been raised 0.02c. per lb., reflecting the new 3 per cent freight tax. Therefore a New York zinc price of 8.67c. per lb. became effective Dec. 1, 1942.



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# SCRAP

... Market Activities and Quotation Trends

## Winter Taking Toll; Distribution Unequal

• • • Nation-wide scrap reports indicate the price winter weather is exacting with shipments falling off in most areas where bad weather accompanies the season assisted by an Ohio River flood which likewise took its toll.

Contrasted with these areas of poor supply, the West Coast reports quantities so abundant that Salvage Section officials are pon-

*An amendment to Order L-239 permits the sale of non-operating military arms and rejected parts as scrap.*

dering what to do about it. One West Coast mill is reported to have offered to purchase 300,000 tons of scrap just to clear yards for preparation of the low grade unprepared scrap which has so jammed yards. Canada generally is in the throes of winter and has begun to suffer severe signs of

impending shortages. New England has come through with plenty of scrap to suffice for the winter. New York worries about Westward allocations of their supply while Buffalo laments an over supply of turnings that won't move even at cut prices. The South reports a comfortable situation.

Poor scrap distribution rears its head with much conversation about over supplies of scrap in some sections, mainly in the Far West, while other areas starve or are loaded with bulks of particular grades. Stock-piling and complete allocation may be called upon at a later date to equalize the quantities and qualities going into each area.

Shipments of iron and steel scrap from July through October were reported as 57.7 of the national quota by Paul C. Cabot, deputy director of the Conservation Division. Contrasted with this New England is said to have

produced 70.95 per cent of the quota.

## G-M Reports Big November Scrap Rise *Detroit*

• • • General Motors recently reported a four-million-pound increase in its November scrap collections compared with those in October. During the first 11 months of 1942 more than 1,000,000,000 lb. of salvage was turned over to material processors by G.M. plants and dealers.

Scrap shipments from the Oldsmobile Division totaled approximately 43,000 tons during 1942, with December furnishing more than 4000 tons of metal of all kinds.

## Rosenwald Quits Conservation Division *Washington*

• • • Because he was "not completely in accord" with the recent reorganization which subordinates his organization to a new war resources agency, Lessing J. Rosenwald, director of the WPB Conservation Division has resigned, effective Feb. 1. Mr. Rosenwald's division supervises the scrap campaigns and often has been criticised regarding its iron and steel and other scrap salvage programs.

## Cabot Appointed to Rosenwald's Position *Washington*

• • • Paul C. Cabot, former Deputy Director of the WPB Conservation Division was appointed Director of a new WPB Salvage Division, it was announced on Monday by WPB. The new division will be in the resources agency group under the Director General for Operations. The Salvage Division will be charged with stimulating the collection of iron and steel scrap, fats and greases, waste paper and other salvage items.

## Dies and Tools Urged Turned In for Scrap

• • • To speed up the collection of industrial scrap now tied up in obsolete or inactive die-casting



A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

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shot and grit for  
endurance**

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has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.



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ABRASIVE  
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Manchester, New Hampshire

HEAT-TREATED STEEL GRIT

## SCRAP

### Army Disposes of Battle Scrap Here

• • • "Demolition scrap" from African battlefields will, under a plan arranged by the Army, be sold directly by the Army to steel mills, after sorting and processing by scrap dealers. At a meeting of Army salvage representatives and scrap dealers in New York at the beginning of the African campaign, plans were worked out for the handling of the material, which is expected to include not only ferrous and non-ferrous scrap, but also shoes, uniforms, rubber and other materials and equipment damaged too severely for repair.

To date none of this material has arrived at the port of New York, though a negligible quantity is reported to have been received at Boston. As previously published in THE IRON AGE, similar demolition scrap has for some time been reaching the West Coast, most of it believed to have come from Pearl Harbor.

dies and tools, the Conservation Division of the WPB urged the owners of such idle steel dies to grant permission to the die-casters in whose plants the obsolete dies are held to turn them in immediately for scrap.

TORONTO — Severe winter weather with a blanket of snow that has covered most of Ontario and Quebec, has resulted in a general slowing down in scrap iron and steel receipts by dealers in the various distribution centers.

BOSTON—WPB has ruled supply of re-rolling street car rails is sufficient for present, but forbids its New England salvaging agency to cut such rails for blast furnace consumption. Rails will have to be stacked for future requirements. Weather conditions have continued against active yard operations. Yards, however, report steel mills have sufficient scrap to tide over until spring.

DETROIT — Heavy snow during the past three weeks has considerably slowed up the movement of scrap into markets here. The availability of electric furnace scrap has also been diminished by allocation of such grades to open hearths by the government. As a result, mill inventories are lightening, although no diminishment of operations as a result is in early prospect.

CINCINNATI—The old materials market has been slowed down during the past week with dealers generally feeling that the flooded Ohio River is largely the cause. Urgency of melters for material, however, has not been as active, although all types of material have been moving steadily.

NEW YORK — Much scrap from this area is still going West, with new allocations being issued by WPB as fast as old ones are filled. One minor annoyance is the fact that, since buyers are not familiar with shipping costs from dealers out of their usual orbits, each new allocation usually means a correspondence about costs.

BUFFALO — Buffalo's three big steel mills were reported this week refusing to accept any more scrap turnings, giving yard operators a new problem to worry about. One mill has three months of turnings on hand and has cut the commission on nickel turnings from \$1 to 50¢. The development came suddenly and insufficient time has elapsed to starting turnings "backing up." Big yard operators, however, expect the "backing up" to start somewhere soon. One yard proprietor is offering turnings below the code with no takers and suggests the OPA code on such scrap should be reduced to around \$14 a gross ton delivered in Buffalo.

BIRMINGHAM—The scrap situation in this district has made it possible for some mills to add to inventories. An increase in the availability of railroad scrap in this area has been particularly noticeable.

ST. LOUIS—Shipments of scrap iron and steel to this market have been heavier during the last week, as a result of better weather, and improved movement

from railroads. Dealers report that the labor situation in yards is becoming more and more acute.

PITTSBURGH — Severe weather here has hindered dealer collections to a substantial extent. Industrial scrap flow is holding well but overall requirements are greater than the supply during the periods of severe weather conditions. There is talk again that drives should be maintained rigidly and continuously during periods of severe weather since ordinary or regular collection methods do not operate at a high rate during those times.

PHILADELPHIA — About all the household drive scrap has been cleaned up, and most yards are short of baling material for processing. There is a good flow of industrial scrap, and low Phos grades are less scarce than they have been. Heavy breakable cast is scarce, but foundry cast is too plentiful for the demand. There have been no mill holdups, and the mills retain good inventories.

CHICAGO — Although hit by cold weather and labor shortages, yards in this area are moving sufficient scrap to maintain ingot operations at capacity. Mill stocks are quite adequate for the time being, but will probably have to be enlarged somewhat to carry through the winter. Mills are now trying to obtain sufficient heavy material to dilute this light scrap. Turnings and borings are extremely plentiful and represent a steadily growing disposal problem.

## PERFORATED METALS

### INDUSTRIAL ORNAMENTAL



ANY METAL ANY PERFORATION

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PERFORATING CO.

5657 FILLMORE STREET—CHICAGO, ILL.  
New York Office, 114 Liberty Street

## SCRAP PRICES

### IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

#### ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES

	(All Prices Are Per Gross Ton)		BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES		Low Phos.	Heavy Structural and Plate	Cut Auto Steel Scrap											
							Bar Crops, Punchings	Plate Scrap	Billet, Bloom, and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	Crank-shafts	Under	1 ft. and Under	Alloy	Heavy Axle	Low Phos. and Turn.
	(No. 1 Heavy Melting; No. 1 Hydr. Compressed Black Sheets, No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Busheling)	Unbaled*	Machine Turnings	Shop Turnings	(Mixed Borings and Turnings; Shoveling Busheling; Cast Iron Borings)	No. 2 Busheling	Crops	Scrap	Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	Crank-shafts	Under	1 ft. and Under	Alloy	Heavy Axle	Low Phos. and Turn.
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton, Cleveland, Middletown, Cincinnati, Portsmouth, Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt., Ashland, Ky., Buffalo, N. Y., Bethlehem, Pa.; Kokomo, Ind., Duluth, Minn., Detroit, Mich., Toledo, Ohio., St. Louis, Mo., Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles, Pittsburgh, Cal.; San Francisco, Minnequa, Colo., Seattle, Wash.	\$20.00 19.50 18.75 19.50 19.25 18.25 18.00 17.85 17.50 17.00 16.50 14.50	\$16.00 15.50 14.75 15.50 15.25 14.25 14.00 13.85 13.50 13.00 12.50 10.50	\$16.00 15.50 14.75 15.50 15.25 14.25 14.00 13.85 13.50 13.00 12.50 10.50	\$17.50 17.00 24.50 22.00 20.50 19.75 19.50 18.85 18.50 18.00 17.50 17.00	\$25.00 24.50 22.50 22.00 21.75 21.25 20.50 20.35 20.00 19.50 19.00 18.50	\$22.50 22.00 21.50 21.00 20.75 20.25 20.00 19.85 19.50 19.00 18.50 18.00	\$21.00 \$21.50 \$22.00 \$20.00 \$20.50 \$21.00 \$18.00 \$19.50 \$21.00	\$21.00 \$21.50 \$22.00 \$20.00 \$20.50 \$21.00 \$18.00 \$19.50 \$21.00	\$20.50 \$20.00 \$19.50 \$19.00 \$18.50 \$18.00 \$17.50 \$17.00 \$16.50	\$20.50 \$20.00 \$19.50 \$19.00 \$18.50 \$18.00 \$17.50 \$17.00 \$16.50	\$20.50 \$20.00 \$19.50 \$19.00 \$18.50 \$18.00 \$17.50 \$17.00 \$16.50	\$18.00 \$18.50 \$18.00 \$17.50 \$17.00 \$16.50 \$15.50 \$15.00 \$14.50	\$19.50 \$21.00 \$20.50 \$17.50 \$18.75 \$19.25 \$18.25 \$18.75 \$19.00	\$21.00						

\*Baled turnings are \$4 per gross ton higher. Dealers may charge \$2 per ton for crushing other than heavy turnings. An industrial producer may charge \$1.

**BUNDLES:** Tin can bundles are \$4 below dealers' No. 2 bundles; No. 3 bundles are \$2 less than No. 1 heavy melting.

**AT NEW YORK** city or Brooklyn, the maximum shipping point price is \$16.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is \$15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of \$6.65 per ton.

**SWITCHING CHARGES:** Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati\*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Clayton, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburgh, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. \*At Cincinnati, for basic open hearth grades, cut auto scrap and auto springs and crankshafts, deduct 80c. per ton.

**PITTSBURGH** basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

**MAXIMUM** prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

**MAXIMUM SHIPPING POINT PRICE**—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation

charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton\*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

**UNPREPARED SCRAP:** For unprepared scrap, maximum prices shall be \$2.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made \$4) less the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

Maximum price of all scrap in a vehicle is that of the lowest price grade in the shipment. This limitation does not apply to vessel shipments if grades are segregated.

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed. For special preparation charges, consult official order.

**CHEMICAL BORINGS:** No. 1 (new, clean, containing not more than 1 per cent oil), \$1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), \$2 less than No. 1 heavy melting. If loaded in box ears add 75c.

**UNPREPARED CAST IRON SCRAP**—Except for heavy breakable cast, unprepared scrap is given a price ceiling of \$2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA.

\*At Memphis 50c.; Great Lakes ports \$1; New England \$1.25.

#### RAILROAD SCRAP

##### Scrap Rails

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown, Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown, Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco, Buffalo, Detroit, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis	\$20.50 21.00 19.75 20.25 18.85 19.00 17.00 19.25 19.25 18.50 16.50 15.50 18.50	\$21.50 22.00 20.75 21.25 19.85 20.00 18.00 20.25 20.25 19.50 17.50 16.50 19.00	\$23.00 23.50 22.25 22.75 21.35 21.50 20.00 22.50 22.50 21.50 20.50 19.50 21.00	\$23.50 24.00 22.75 23.00 21.85 22.00 20.00 22.25 22.25 21.50 20.50 19.50 21.00	\$23.75 24.25 23.00 23.25 22.35 22.50 20.50 22.50 22.50 21.75 20.75 19.75 21.25	\$24.00 24.50 23.25 23.50 22.50 22.75 20.50 22.75 22.75 22.00 21.00 19.00 21.50

#### CAST IRON SCRAP

##### Group A Group B Group C

No. 1 cupola cast.....	\$18.00	\$19.00	\$20.00
No. 1 machinery cast, drop broken, 150 lbs. and under.....	18.00	19.00	20.00
Clean auto cast.....	18.00	19.00	20.00
Unstripped motor blocks.....	17.50	18.50	19.50
Stove Plate.....	17.00	18.00	19.00
Heavy Breakable Cast.....	15.50	16.50	17.50
Charging Box Size Cast.....	17.00	18.00	19.00
Misc. Malleable.....	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B: switching district of Kansas City, Kan., Mo.

## MAN-HOURS SAVED IN SIGNAL CORPS PRODUCTION



The castings at the top and bottom are used in field switchboards

Zinc alloy die castings have long achieved economies in the field of communications. It was quite natural, consequently, that this metal and production method should serve in many ways in equipment for the U. S. Army Signal Corps.

Typical of the zinc alloy die castings employed in field telephone production are the switchboard key frame castings which border the illustration above. Think of the man-hours saved through the ability of the die casting process to provide—as cast—the numerous openings for the keyboard mechanism in these parts! Think, also, of the conservation of machining and assembling facilities!

These savings are measured today in terms of time and man-hours, but they add up to low cost as well. Perhaps this wartime application of zinc alloy die castings provides the key to many of your present and future production problems.

# THE

New Jersey  
**Zinc**



## ALLOY POT

A publication issued for many years by THE NEW JERSEY ZINC COMPANY to report on trends and accomplishments in the field of die castings. Title Reg. U. S. Pat. Off.

IRON AGE EDITION

No. 5

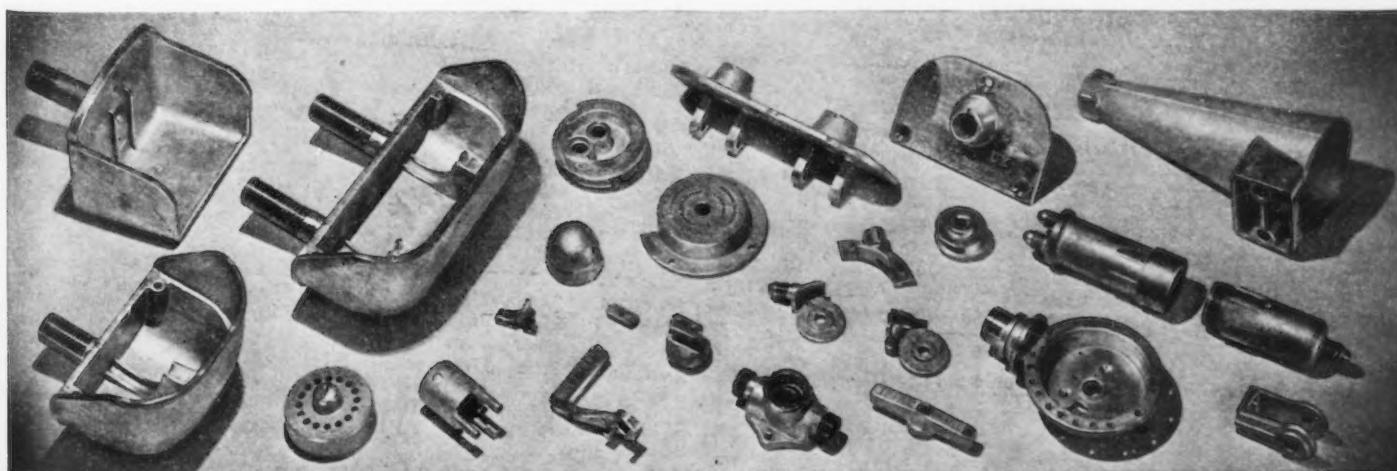
## THE VERSATILITY OF ZINC ALLOY DIE CASTINGS

There are many examples of thorough utilization of zinc alloy die castings in producing complicated assemblies. Such strong endorsement of the versatility of this comparative newcomer among high speed production methods and materials occurs in many fields.

The parts illustrated below are particularly up-to-date in this respect because they make up a fire extinguisher assembly used in all U. S. Army tanks. The end-use of this assembly is interesting, but it is the castings themselves which reveal the reasons behind the use of zinc alloy die castings.

Consider these castings in the light of ingenuity of design for compactness—1 part where there would ordinarily be 3 or 4—exacting uniformity for closer fits for operating parts—unusual shapes to utilize every available inch of space.

For additional examples of the advantages of zinc alloy die castings, ask us—on your Company letterhead—for copies of five small booklets illustrating applications in five major consuming fields.



Some of these parts are duplicated in every installation

THE NEW JERSEY ZINC COMPANY

**HORSE HEAD SPECIAL (** 99.99 + % Uniform Quality **) ZINC**

160 FRONT ST., NEW YORK CITY

 99.99 + %  
Uniform Quality

# Comparison of Prices . . .

Advances Over Past Week in Heavy Type; Declines in Italics.

[Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel:	Jan. 12,	Jan. 4,	Dec. 14,	Jan. 13,	Pig Iron:	Jan. 12,	Jan. 4,	Dec. 14,	Jan. 13,
(Cents Per Lb.)	1943	1943	1942	1942	(Per Gross Ton)	1943	1943	1942	1942
Hot rolled sheets . . . . .	2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia . . . . .	\$25.89	\$25.89	\$25.89	\$25.84
Cold rolled sheets . . . . .	3.05	3.05	3.05	3.05	No. 2, Valley furnace . . . . .	24.00	24.00	24.00	24.00
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50	No. 2, Southern Cin'ti . . . . .	24.68	24.68	24.68	24.06
Hot rolled strip . . . . .	2.10	2.10	2.10	2.10	No. 2, Birmingham . . . . .	20.38	20.38	20.38	20.38
Cold rolled strip . . . . .	2.80	2.80	2.80	2.80	No. 2, foundry, Chicago† . . . . .	24.00	24.00	24.00	24.00
Plates . . . . .	2.10	2.10	2.10	2.10	Basic, del'd eastern Pa. . . . .	25.39	25.39	25.39	25.34
Plates, wrought iron . . . . .	3.80	3.80	3.80	3.80	Basic, Valley furnace . . . . .	23.50	23.50	23.50	23.50
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00	Malleable, Chicago† . . . . .	24.00	24.00	24.00	24.00
					Malleable, Valley . . . . .	24.00	24.00	24.00	24.00
					L. S. charcoal, Chicago . . . . .	31.34	31.34	31.34	31.34
					Ferromanganese‡ . . . . .	135.00	135.00	135.00	120.00

## Tin and Terne Plate:

(Dollars Per Base Box)

Tin plate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tin plate, electrolytic . . . . .	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

‡For carlots at seaboard.

## Bars and Shapes:

(Cents Per Lb.)

Merchant bars . . . . .	2.15	2.15	2.15	2.15
Cold finished bars . . . . .	2.65	2.65	2.65	2.65
Alloy bars . . . . .	2.70	2.70	2.70	2.70
Structural shapes . . . . .	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars . . . . .	4.40	4.40	4.40	4.40

## Scrap:

(Per Gross Ton)

Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	23.00
No. 1 cast, Pittsburgh	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	24.00
No. 1 cast, Ch'go	20.00	20.00	20.00

## Wire and Wire Products:

(Cents Per Lb.)

Plain wire . . . . .	2.60	2.60	2.60	2.60
Wire nails . . . . .	2.55	2.55	2.55	2.55

## Rails:

(Dollars Per Gross Ton)

Heavy rails . . . . .	\$40.00	\$40.00	\$40.00	\$40.00
Light rails . . . . .	40.00	40.00	40.00	40.00

## Semi-Finished Steel:

(Dollars Per Gross Ton)

Rerolling billets . . . . .	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars . . . . .	34.00	34.00	34.00	34.00
Slabs . . . . .	34.00	34.00	34.00	34.00
Forging billets . . . . .	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

## Wire Rods and Skelp:

(Cents Per Lb.)

Wire rods . . . . .	2.00	2.00	2.00	2.00
Skelp (grvd) . . . . .	1.90	1.90	1.90	1.90

The various basing points for finished and semi-finished steel are listed in the detailed price tables, to be published in the Jan. 28 issue.

# Composite Prices . . .

## FINISHED STEEL

Jan. 12, 1943 . . . . .	2.30467c. a Lb.	.....	.....	.....
One week ago . . . . .	2.30467c. a Lb.	.....	.....	.....
One month ago . . . . .	2.30467c. a Lb.	.....	.....	.....
One year ago . . . . .	2.30467c. a Lb.	.....	.....	.....

## PIG IRON

23.61	a Gross Ton . . . . .	.....
23.61	a Gross Ton . . . . .	.....
23.61	a Gross Ton . . . . .	.....
23.61	a Gross Ton . . . . .	.....

## SCRAP STEEL

\$19.17	a Gross Ton . . . . .	.....
\$19.17	a Gross Ton . . . . .	.....
\$19.17	a Gross Ton . . . . .	.....

1942 . . . . .	HIGH	LOW	1942 . . . . .	HIGH	LOW
2.30467c.,	2.30467c.,	2.30467c.,	\$23.61	\$23.61	\$23.61
2.30467c.,	2.30467c.,	2.30467c.,	\$23.61, Mar. 20	\$23.45, Jan. 2	\$22.61, Jan. 2
2.30467c., Jan. 2	2.24107c., Apr. 16	2.24107c.,	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30
2.35367c., Jan. 3	2.26689c., May 16	2.26689c.,	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3
2.58414c., Jan. 4	2.27207c., Oct. 18	2.27207c.,	22.35, June 21	19.61, July 6	15.00, Nov. 22
2.58414c., Mar. 9	2.32263c., Jan. 4	2.32263c.,	22.35, Mar. 9	20.25, Feb. 16	21.92, Mar. 30
2.32263c., Dec. 28	2.05200c., Mar. 10	2.05200c.,	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21
2.07642c., Oct. 1	2.06492c., Jan. 8	2.06492c.,	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10
2.15367c., Apr. 24	1.95757c., Jan. 2	1.95757c.,	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13
1.95578c., Oct. 3	1.75836c., May 2	1.75836c.,	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8
1.89196c., July 5	1.83901c., Mar. 1	1.83901c.,	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12
1.99629c., Jan. 13	1.86586c., Dec. 29	1.86586c.,	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6
2.25488c., Jan. 7	1.97319c., Dec. 9	1.97319c.,	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18
2.31773c., May 28	2.26498c., Oct. 29	2.26498c.,	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index re-capitalized in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

# Thorough cleaning means longer lathe service



*Information supplied by an Industrial publication*

In cleaning lathes it is common practice to brush chips, dust, and dirt off lathe ways and surfaces, spindle threads, and other obvious places.

There are other parts where cleaning is equally important, but that are likely to be overlooked. One is the lead screw, and the other is the interior threads in the chuck or face plate back.

The former can be effectively cleaned by holding a cord, or piece of twine of suitable diameter in the

thread groove, and pulling the ends back and forth as the screw revolves. The motion is similar to that used in polishing shoes.

Interior threads can be cleaned by a simple tool made out of a piece of heavy steel wire. The wire is bent into a loop, with the ends bent at right angles. The tool works better if the ends are filed to the V-shape of the threads, the spring in the loop will hold the ends tightly in the thread grooves.

Climax furnishes authoritative engineering data on molybdenum applications.  
MOLYBDIC OXIDE BRIQUETTES • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

**Climax Molybdenum Company**  
**500 Fifth Avenue • New York City**

# Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point ↓ Product	DELIVERED TO														
	Pitts- burgh	Chi- cago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Philadel- phia
<b>SHEETS</b>															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.22¢	2.35¢	2.28¢
Cold rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.47¢	3.73¢	3.69¢
Long ternes <sup>2</sup>	3.80¢		3.80¢									4.55¢		4.18¢	4.14¢
<b>STRIP</b>															
Hot rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.22¢	2.48¢	
Cold rolled <sup>4</sup>	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.07¢	3.33¢	
<b>TIN MILL PRODUCTS</b>															
Coke tin plate, base box	\$5.00	\$5.00	\$5.00						\$5.10					5.38¢	5.34¢
Electrolytic tin plate, box	\$4.50		\$4.50												
Black plate, 29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ <sup>12</sup>			3.39¢
Mfg. ternes, special box	\$4.30	\$4.30	\$4.30						\$4.40						
<b>BARS</b>															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.52¢	2.80¢	2.27¢	2.51¢	2.49¢
Rail steel <sup>6</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢ <sup>13</sup>	2.27¢	2.40¢	
Reinforcing (rail) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢ <sup>13</sup>	2.27¢	2.49¢	
Cold finished <sup>8</sup>	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70¢			2.70¢				Bethlehem, Massillon, Canton = 2.70¢)					2.82¢	
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢								3.47¢	
									(Coatesville and Claymont = 2.10¢)						
<b>PLATES</b>															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ <sup>11</sup>		2.47¢	2.65¢	2.33¢	2.30¢	2.155¢
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢		3.73¢	3.69¢
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)					3.97¢	4.15¢		3.71¢	3.60¢
<b>SHAPES</b>															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.47¢	2.75¢		2.28¢	2.22¢
<b>SPRING STEEL, C-R</b>															
0.26 to 0.50 Carbon	2.80¢			2.80¢				(Worcester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢			4.30¢				(Worcester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢			6.15¢				(Worcester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢			8.35¢				(Worcester = 8.55¢)							
<b>WIRE<sup>9</sup></b>															
Bright <sup>18</sup>	2.60¢	2.60¢		2.60¢	2.60¢			(Worcester = 2.70¢)			3.10¢			2.94¢	
Galvanized								add proper size extra and galvanized extra to bright wire base, above.							
Spring (High Carbon)	3.20¢	3.20¢		3.20¢				(Worcester = 3.30¢)			3.70¢			3.54¢	
<b>PILING</b>															
Steel sheet	2.40¢	2.40¢				2.40¢					2.95¢			2.74¢	

<sup>1</sup> Mill run sheets are 10¢. per 100 lb. less than base; and primes only, 25¢. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>3</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>5</sup> Applies to certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Prices for straight length material only, from a producer to a consumer. Functional discount of 25¢. per 100 lb. to fabricators. <sup>8</sup> Also shafting. For quantities of 20,000 to 39,999 lb. <sup>9</sup> Carload lot to manufacturing trade. <sup>10</sup> These prices do not apply if the customary means of transportation (rail and water) are not used. <sup>11</sup> Ship plates only. <sup>12</sup> Boxed. <sup>13</sup> Portland and Seattle price. San Francisco price is 2.50¢. <sup>14</sup> This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE NO. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35¢. at established basing points; Calumet Steel division of Borg Warner may quote 2.35¢. Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35¢. Chicago base. On rail steel bars Sweets Steel Co. may quote 2.33¢. f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75¢. at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30¢. Chicago base. On plates, Granite City Steel Co. may quote 2.35¢. f.o.b. mill, and Central Iron & Steel Co. may quote 2.20¢. f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30¢. established basing points and 2.50¢. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40¢. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all\* rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at \$49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at \$34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at \$34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at \$50 at established basing points and slabs at \$41; Empire Sheet and Tin Plate may sell slabs at \$41 at established basing points and sheet bars at \$39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge \$41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge \$36 per ton for small billets, f.o.b. Portsmouth and \$37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.